STOPPING WATER POLLUTION AT ITS SOURCE

MISA

Municipal/Industrial Strategy for Abatement

SIX MONTH MONITORING DATA REPORT

ORGANIC CHEMICAL MANUFACTURING SECTOR

(OCTOBER 1, 1989 to MARCH 31, 1990)

Ontario

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MUNICIPAL-INDUSTRIAL STRATEGY FOR ABATEMENT

(MISA)

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ORGANIC CHEMICAL MANUFACTURING SECTOR

(Period Covered October 01, 1989 to March 31, 1990)

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Water Resources Branch
Ontario Ministry of the Environment

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EXECUTIVE SUMMARY

This report presents, in graphical and tabular form, the results of monitoring of intake and effluent streams by twenty Organic Chemical Manufacturing (OCM) Sector plants for the six month period from October 1, 1989 to March 31, 1990.

The monitoring was a requirement of Ontario Regulation 209/89 under the Ontario Ministry of the Environment Municipal - Industrial Strategy for Abatement (MISA) initiative.

The purpose of the monitoring phase of the MISA program was to establish a data base on loadings of contaminants from direct dischargers and to provide data for the selection of parameters for technology-based limits under the MISA limits phase. Technology-based options may include chemical substitution, source control and in-plant or end-of-pipe treatment.

Of the 156 parameters specified for monitoring, 116 were found in one or more of the Sector effluents at Regulation Method Detection Limit (RMDL) concentrations or above. Individual site found parameter totals ranged from 79 parameters at the Dow Chemical Canada Inc. Sarnia plant to 3 parameters at Akzo Chemicals Ltd. In some cases, parameters found in the effluents were also found in the intake water at comparable concentrations.

A matrix of the parameters found in Sector plant effluents is provided for quick identification of specific parameters at each plant site. In addition, key parameters specific to each plant site's effluents are highlighted in two separate tables.

Chlorinated dibenzo-p-dioxins and dibenzofurans were identified in effluents at five plant sites -Dow Chemical at Sarnia, B.F. Goodrich Canada Inc., at Welland, Uniroyal Chemical Ltd., at Elmira and Dupont Canada Inc., at Kingston and Maitland. However, in all but one case, quantification is somewhat tentative because the results are based on the analysis of only two samples.

OCM Sector plant sites identified as being among the larger dischargers of conventional contaminants, grouped by major receiving water basins included:

- Dow Chemical, Polysar, Esso Chemical and Ethyl to the St. Clair River
- Celanese, Dupont (Kingston) and G.E. Plastics to Lake Ontario
- Courtaulds Fibres and Dupont (Maitland) to the St. Lawrence River

The monitoring results, in the form of six-month average concentrations, flows and loadings, are presented in tables in Appendices D, E and F. Plants are grouped according to the three major receiving water basins to which they discharge - the St. Clair River, Lake Erie/Ontario and the St. Lawrence River.

Plots of typical monitoring results, in the form of six-month intake and effluent loadings for fourteen selected parameters, are shown in Appendix B. Additional plots in Appendix C show monthly average loadings for three of the fourteen parameters.

To support the interpretation of the data, explanatory notes are provided in Appendix A. The notes include definitions of key terms, clarification of data treatment and calculation procedures and two reference tables showing RMDL values and Provincial Water Quality Guidelines and Objectives for the parameters monitored by the OCM Sector.

I INTRODUCTION

The Municipal-Industrial Strategy for Abatement (MISA) Program is a Ministry of the Environment regulatory initiative with the ultimate goal of virtual elimination of toxic contaminants from municipal and industrial discharges to Ontario's waterways.

Under the first phase of the program, effluent monitoring regulations were promulgated for nine industrial sectors requiring each to perform twelve months of intensive monitoring of its effluents. The Organic Chemical Manufacturing (OCM) Sector, as one of the nine industrial sectors, began its regulatory monitoring period on October 1, 1989.

This report presents the data obtained for the OCM Sector of the first six months of the regulatory effluent monitoring covering the period from October 1, 1989 to March 31, 1990.

The data are presented, in tabular and graphical form, as six-month average concentrations and loadings for all plant effluents. Intake water data are presented alongside effluent data to provide a clearer picture of the actual contaminant contribution from each plant. The plants are grouped by the receiving water basins to which they discharge - the St. Clair River, Lake Erie/Ontario and the St. Lawrence River.

A second report covering the complete twelve-month regulatory monitoring period for the OCM Sector is currently in preparation and will be available shortly.

The data from the twelve-month regulatory monitoring period will be used together with performance data obtained for the Best Available Technology Economically Achievable (BATEA) from the world-wide BAT Study, to set effluent limits for the OCM Sector in the next phase of the MISA program. The BAT study is currently being carried out for the Ministry by Science Applications International Corporation.

II BACKGROUND

GENERAL

The data summarized in this report were submitted under the MISA program as a regulatory requirement for the OCM Sector under a generic "how to" regulation for all the sectors - O. Regulation 695/88 and its amendment - O. Regulation 533/89 and a sector-specific regulation - O. Regulation 209/89 and its three amendments.

Twenty-two plants were included in the OCM Sector under the original Ontario Regulation 209/89 and its amendment O. Regulation 532/89. Five plants were added for twelve months of monitoring as of February 1, 1990 under O. Regulation 45/90 and one plant was added as of August 1, 1990 under O. Regulation 416/90.

Two plants were shutdown in the 1989-90 period for business reasons unrelated to the MISA program leaving a total of twenty-six plants currently in the sector.

The MISA OCM Monitoring Regulations, through site-specific schedules required twelve months of intensive monitoring for specified parameters at daily, weekly, thrice-weekly, monthly, quarterly and semi-annual frequencies.

The Development Document for the Effluent Monitoring Regulation for the Organic Chemical Manufacturing Sector (ISBN: 0-7729-5565-4, May 1989, Queen's Printer) provides the technical rationale for the selection of parameters and their monitoring frequencies.

At the end of the twelve-month intensive monitoring period, each plant was required to maintain an ongoing reduced level of monitoring for only the daily frequency parameters until the limits regulation comes into force. In addition plant sites are monitoring other parameters that are reported in the Ministry's, "Report on the 1989 Industrial Direct Dischargers in Ontario".

Because only two months of data were available within the six-month report window of October 1, 1989 to March 31, 1990 for five plants which began regulatory monitoring on February 1, 1990, a decision was made to hold over the data to the twelve month report. The same decision was made in the case of a sixth plant site which began regulatory monitoring on August 1, 1990. In addition, data for the twenty-one stormwater streams monitored by the Sector plants have also been deferred to the twelve-month report.

The data presented in this six-month report, therefore, cover the results of MISA regulatory monitoring for only the twenty plant sites which began monitoring on October 1, 1989.

THE OCM SECTOR

The twenty-six OCM Sector direct discharger plants under the MISA program are located throughout the Great Lakes Basin. Nine of the plants are located along the St. Clair River with the others located along Lake Ontario between Cobourg and Kingston; along the St. Lawrence River between Brockville and Cornwall; in the Niagara area; north of Orillia and at Elmira.

The plants manufacture a wide range of products including fibres (nylon, rayon, polyester and spandex), plastics (PVC, ABS, polyethylene, polystyrene, engineering resins), synthetic rubbers, phenol-formaldehyde resins, chlorinated hydrocarbons and synthetic detergent bases and fabric softeners.

Table 1 provides specific information on each of the twenty plants covered by this report. The plants are grouped by receiving water. Included is information on location, number of employees, raw materials, products, effluent treatment and number of effluents.

III DATABASE DESCRIPTION

(i) REPORTING

Each plant site was required by regulation to report its monitoring data to the Regional Ministry Office within 60-90 days of sample collection using computer diskettes customized for each plant under the MISA Data Entry System (MIDES). The diskette data were checked for completeness prior to being transferred to the Ministry central computer system (SIS).

(ii) VALIDATION

The standard procedure for validating data for the six-month report consisted of a series of iterations of data downloading from SIS, statistical report generation showing averages, statistical outliers and multiple entries, site reviews of reports and error corrections.

Statistical outliers were included in the reported database because they could not be distinguished from potentially real values representative of normal operating conditions. Data with potential QA/QC concerns were also included pending an analysis of QA/QC data to be discussed in the twelve-month report.

A majority of the sector plants purchased a statistical software package, entitled QDMS (Quick and Dirty MIDES Statistics), developed for the sector at the Wastewater Technology Centre, to use in calculating statistical parameters for their own databases to confirm the Ministry reported calculations.

(iii) TREATMENT OF REMARK-CODED DATA

The MIDES program allowed each plant site to clarify or qualify each data entry with a remark code from a list of twenty-nine standard remark codes. Typical remark codes could highlight late data, no data, " less than" values, "attached report" explanations, analytical interferences, improper preservation, multi-phase samples and approximate values.

As part of the data analysis for this report, a remark code table was generated showing the number of data points with each remark code for each one of the twenty plant sites. Follow-up discussions with plant sites resulted in data being rejected from the six-month report if coded with one of the following six remark codes: interference, multiphase sample, sample improperly preserved, data unreliable, insufficient volume and no effluent. All other remark-coded data were retained.

(iv) SIZE

Approximately 148,000 data points were generated for the six-month report covering the analysis of parameters in 68 effluent streams, including 48 final discharges and 18 of the 20 plant water intakes.

Approximately 1200 of the 148,000 data points, equivalent to 0.8% of the database, were rejected on the basis of the adopted remark code policy. Another 4800 data fields or about 3.2% of the database were coded as "no data" indicating plant sites had been unable to provide the data.

(v) QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The regulation required that each plant site collect and analyze monthly and quarterly field QA/QC samples. The QA/QC set included a duplicate sample, a travelling blank sample and a travelling spiked blank sample.

The analysis of the QA/QC results will be done on the full twelve-month database and will be discussed as part of the twelve-month monitoring data report.

In addition to field QA/QC requirements, several other measures were taken to ensure a high quality database. Analytical laboratories were required to submit evidence of being able to meet Ministry-specified detection limits for each of the parameters to be monitored (Regulation Method Detection Limit - RMDL). Only regulation-specified analytical method principles could be used for parameter analysis.

Each of the laboratories performing analyses for the MISA program was required to adhere to standard good laboratory practices including regular checks of laboratory QA/QC. Adherence to the standards was verified by onsite inspections by members of the Ministry Laboratory Services Branch.

Throughout the program, Operations Division MISA staff ensured compliance with the monitoring regulations. They inspected all of the plants during the monitoring period and carried out audit sampling. The Ministry Laboratory Services Branch analyzed the audit samples to verify the analytical data obtained by the Sector plants. Results of the Ministry audits will be reported in the twelve-month report.

Pre-regulation inspections were made to ensure that plant sampling locations would provide representative samples and that sampling equipment to be used adhered to the requirements specified in the regulation.

IV DISCUSSION OF RESULTS

GENERAL

A list of the 156 parameters monitored under regulation by the OCM Sector plants along with corresponding RMDL values is shown in Table A-1 in Appendix A. The list corresponds to the OCM Sector Effluent Monitoring Priority Pollutants List (EMPPL).

Plants were required to characterize their effluents for the full list of parameters at least semi-annually with most companies being required to do full-list quarterly monitoring. Selected parameters from the list were added for more frequent monitoring - daily, thrice-weekly, weekly and monthly in site-specific schedules in the regulation. Once-through non-contact cooling water required monthly monitoring.

In addition, plant sites were required to perform **open** characterization of their effluents to identify and to determine the approximate quantities of any volatile and extractable organic parameters and to check for 70 specified metals using mass spectroscopy and emission spectrometry. Any significant new parameters found would be candidates for addition to the EMPPL.

Intake water monitoring was not a regulatory requirement but plant sites generally monitored intake water on a monthly basis for the same parameters that were being monitored under their more frequent parameter effluent monitoring requirements. Two plants, Akzo Chemicals Ltd. and Ethyl Canada Inc. did not provide any intake water monitoring data.

Two plant sites, Polysar and Uniroyal, were required to monitor two streams passing through their property - the Cole Drain and Shirt Factory Creek respectively.

The tables in Appendices D, E and F show the monitoring results for the OCM Sector in the form of six-month average concentration, flow and loading values for parameters in individual intake and effluent streams monitored at each plant site. Twelve conventional parameters are shown at the beginning of each table. Other parameters which were monitored are shown along with their concentration and loading averages only if they were **"found"** where "found" is defined according to the 90/10 edit rule described in Appendix A.

The data in the tables are calculated from the daily, thrice-weekly, weekly, monthly and quarterly data sets submitted by the sector plants under the regulation. Statistical outliers and data for parameters with potential field QA/QC concerns are included but may not be representative of the true database.

The six-month average values for the conventional parameters were generally based on 26, 78 or 180 observations corresponding to weekly, thrice-weekly or daily monitoring respectively. Averages for the remaining parameters were mostly based on 2 to 6 data points representing quarterly and monthly monitoring respectively.

Appendix A contains the explanatory notes which provide information on definitions, calculations, data treatment and underlying assumptions needed for the correct interpretation of the data tables.

Tables A-1 and A-2 in Appendix A provide respectively, a listing of the Regulation Method Detection Limits for all of the parameters monitored by the OCM Sector and a summary of the available Provincial Water Quality Objectives and Guidelines (PWQO/G's) for the parameters monitored under the regulation.

Plots of typical monitoring results in the form of six-month average flows and intake and effluent loadings for eleven selected conventional parameters and three metals are shown in Appendix B. Additional plots, breaking down the six-month average data to monthly average loadings for three selected conventional parameters are presented in Appendix C.

The data in the tables and the plots are grouped by discharges to one of the three major receiving basins: the St. Clair River, Lake Erie/Ontario or the St Lawrence River.

COMPARISON OF PLANT EFFLUENT FLOWS

Figure B-1 in Appendix B, provides a comparison of the six-month average total site effluent flows for each plant site to provide a perspective on the potential impact of flow on the calculation of loadings from Sector plants.

Three plants, Dow, Polysar and Dupont (Maitland) are categorized as high flow plants with effluent discharges up to one million cubic metres/day. Seven other plants are categorized as medium flow with effluent discharges up to 100 000 cubic metres/day and ten plants are listed as low flow with effluent volumes less than 5 000 cubic metres/day.

For plants with high water flows, the detection of parameters at concentrations near or at the RMDL can lead to what appear to be significant loadings either in their discharges or intakes. For example, for a flow of 500 000 cubic metres/day and a parameter with a detection level concentration of 10 ug/l, the calculated loading would be 5 kg/day.

Loadings calculated for detection-level concentrations should not always be taken as proof-positive of the real presence of the parameters being measured.

ACUTE LETHALITY RESULTS

Rainbow trout and Daphnia magna acute lethality tests were required monthly on all final discharges to watercourses.

The results of the first six months of acute lethality testing indicated that one or more discharges were acutely lethal to trout and/or Daphnia magna for the majority of the samples from a given final effluent taken from the following six plant sites:

Cornwall Chemicals Ltd. - Cornwall

Courtaulds Fibres Canada - Cornwall

Dupont Canada Inc. - Kingston

Dupont Canada Inc. - Maitland

G.E. Plastics Canada Ltd. - Cobourg

Uniroyal Chemical Ltd. - Elmira

The detailed acute lethality results are reported in a separate document entitled, "Acute Lethality Data for Ontario's Organic Chemical Manufacturing Sector Effluents - October 1989 to March 1990", Aquatic Toxicity Unit, Ministry of the Environment, September 1991.

PARAMETERS FOUND IN SECTOR EFFLUENTS

Table 2 is a matrix of parameters found at each plant site based on the 90/10 edit rule. The trigger value of RMDL or above used for the "found" edit is very conservative resulting in the categorization of parameters as "found" with averages at the detection limit or just above. The details of the 90/10 edit rule are presented in Appendix A.

The matrix allows for quick identification of OCM Sector plant sources for any of the conventional and Sector priority pollutants of interest. Out of the 156 parameters set out for regulatory monitoring for the OCM Sector, a total of 116 were found in one or more of the sector effluents. Parameter totals found in effluents at individual sites ranged from 79 parameters, including 12 conventional parameters, at Dow Chemical in Sarnia to 3 parameters at Akzo Chemicals Ltd in Sarnia. Since some of the reported parameters were also found in the intake water, the data tables in Appendices D, E and F should be checked to determine the source of the contaminants at each plant site.

Specific conductance is shown as a found parameter for all of the plant sites only because the trigger value used for comparison was that of ultra pure conductivity water at 5 uS/cm. Specific conductance levels for pristine water bodies would normally be in the range of 100-300 uS/cm.

A set of Provincial Water Quality Objectives and Guidelines and their definition is included in Appendix A.

Specific average values of concentrations and loadings corresponding to each shaded cell in the Table 2 matrix can be obtained from the six-month data tables in Appendices D, E or F.

LOADINGS OF CONVENTIONAL/METAL PARAMETERS

(i) SIX-MONTH AVERAGE LOADING PLOTS

Figures B-2 to B-15 compare individual plant six-month loadings for fourteen parameters discharged to the three major receiving water basins potentially impacted by the plants - the St. Clair River, Lake Erie/Ontario and the St. Lawrence River.

The fourteen parameters include a group of typical conventional contaminants such as DOC, ammonia, nitrate, TKN, TSS, VSS, phosphorus, oil and grease, cyanide, phenolics and sulphide and three ubiquitous metals - aluminum, copper and zinc. The parameters were selected for plotting on the basis of quantities discharged and their universal presence in the sector effluents. Where available, plant intake loadings were plotted alongside the effluent loadings.

The data for the plots were taken from the INTAKE and TOTAL Column values shown in the six-month loading tables in Appendices D, E and F.

The plots aid in the identification of the major sector dischargers for the selected parameters and provide a comparison of the potential environmental impact of these discharges. The several orders of magnitude differences in the ranges of some of the plotted data reflect the diversity of plant sizes and processes within the Sector.

In general, a review of the plotted data for the twenty OCM Sector plants shows that the following nine plants produced the highest discharges:

- Dow, Polysar, Esso Chemical and Ethyl discharging to the St. Clair River
- Dupont (Kingston), Celanese and G.E. Plastics discharging to Lake Ontario
- Courtaulds and Dupont (Maitland) discharging to the St. Lawrence River

Table 3 shows both the intake water and final plant six-month average loadings in kilograms per day for the top nine dischargers. Data for plant sites not listed in the table can be obtained from the specific plant tables in Appendices D, E or F.

(ii) MONTHLY AVERAGE LOADING PLOTS

Figures C-1 to C-3 show the individual plant monthly average intake and effluent loadings for three conventional parameters - DOC, TSS and oil and grease. The monthly effluent averages are generally based on 30 data points for DOC, 12 data points for TSS and 4 data points for oil and grease. The corresponding monthly intake data are generally based on a single monthly sample.

Data for all twenty plants are plotted for completeness. The several orders of magnitude scale differentials among the plots for a given parameter clearly identify the same major dischargers as were identified by the six-month average data.

The plots are useful for showing the monthly or seasonal effluent trends. They clearly show the relationship between intake and effluent loadings. The plots illustrate several cases where loadings in the plant intake water contribute significantly to effluent loadings. The plots appear to show no obvious seasonal trends.

LOADINGS OF EMPPL CONTAMINANTS

Table 4 identifies the top OCM Sector dischargers of EMPPL contaminants. Both intake water and effluent six-month average loadings in kilograms per day are shown. The data are extracted from the tables in Appendices D, E and F.

For simplicity, the EMPPL contaminants are shown grouped by their generic analytical test group (ATG) families. The specific parameters in each ATG are listed in Table A-1. Specific parameter loadings may be obtained from the tables in Appendices D, E and F.

Where chlorinated dibenzodioxins and dibenzofurans are listed, the data tables in Appendices D, E and F should be checked to determine the specific congeners found and their concentrations.

DISCHARGE OF POLYCHLORINATED DIBENZO-p-DIOXINS (PCDDs) AND POLYCHLORINATED DIBENZOFURANS (PCDFs)

PCDDs and PCDFs refer to families of related chemical compounds including 75 PCDDs and 135 PCDFs. The most toxic forms are those containing 4 to 6 chlorine atoms with 2,3,7,8-tetrachlorodibenzo-p-dioxin (T4CDD) being the most toxic of all. The Ontario Drinking Water Maximum Allowable Concentration for 2,3,7,8-T4CDD is 15 pg/l.

The octachlorodibenzo-p-dioxins and their octafuran equivalents are the least toxic with an estimated toxicity 1000 times less than that of 2,3,7,8-T4CDD. The octa chlorinated form of dioxins and furans is also the most commonly found.

The sources of PCDDs and PCDFs in Ontario are typically combustion units including municipal refuse and sludge incinerators, the use of products such as chlorinated phenols and transboundary water and air contamination.

PCDDs and PCDFs have been identified in effluents at five OCM Sector plants - Dow Chemical, Sarnia; B.F. Goodrich, Welland; Uniroyal Chemical, Elmira; Dupont, Kingston and Dupont, Maitland.

Most of the results are based on data from the analysis of only two samples. In some cases PCDDs and PCDFs were listed as found on the basis of the 90/10 edit rule when the data were reported as less than detection by the laboratory if the laboratory was reporting the results against the original RMDL value of 300 pg/l rather than the later regulation required RMDLs in the 15-30 pg/l range.

At Dow's Sarnia plant, PCDDs and PCDFs were found in six streams. The stream showing the highest concentrations is a water scrubber stream (PR1200) for the off-gas from a thermal oxidizer unit which incinerates chlorinated organic vapours. The stream flows into the site's 54 inch sewer (CO0500) where it is diluted by about a factor of 40 with cooling water before being discharged to the St. Clair River. PCDDs and PCDFs were also detected in the 54 inch sewer discharge.

At B.F. Goodrich, Welland, only octachlorodibenzo-p-dioxin was detected but at comparable levels of 380 pg/l and 250 pg/l in the effluent and intake water respectively.

At the Dupont plant in Kingston a total of 5 PCDDs and PCDFs were reported in the staple sewer stream (PR1000). However, with the exception of one value of 390 pg/l for total tetrachlorodibenzo-p-dioxins (excluding 2,3,7,8-T4CDD) and one value of 41 pg/l for octachlorodibenzo-p-dioxin, the analytical data for the three other PCDDs and PCDFs is reported below detection. However, the laboratory detection level of 300 pg/l at the time of analysis was above the 15-30 pg/l RMDL.

At Uniroyal Chemical, octachloro and heptachlorodibenzofurans were found in the #11 outfall. The contamination may be related to previous manufacture of pesticides at the site.

At Dupont's Maitland site, a total of 4 PCDDs and PCDFs were found in the effluent from the chlorofluorocarbon production unit. In two other streams only octachlorodibenzo-p-dioxin and octachlorodibenzofuran were detected. The highest reported PCDD concentration was a two sample average of 1310 pg/l of total tetrachlorodibenzo-p-dioxins in the site effluent to the river (C01100). The average was based on an initial value of 2600 pg/l in November 1989 and a " less than" 20 pg/l value in February 1990.

Specific PCDD and PCDF concentrations for the streams in which they were found are reported in the tables in Appendices D, E and F.

SIX-MONTH CONCENTRATION/LOADING TABLES

DATA INTERPRETATION

The tables in Appendices D, E and F present six-month average concentration and loading data for twelve conventional parameters together with any of the EMPPL parameters which qualified as found under the 90/10 edit rule.

In reviewing the data in the tables, the following points should be noted:

- concentration averages for a given parameter within a 1 to 5-fold range of the Regulation Method Detection Limit especially if based on a limited number of data points (6 points or less) should be regarded as being semi-quantitative only

- corresponding loadings calculated from semi-quantitative concentration data should also be regarded as being semi-quantitative

- **concentration values reported as less than the analytical detection limit (coded as "<" or "< DL") were assigned the value of the detection limit for the purposes of calculating averages**

- since values coded as "less than the analytical detection limit" values can also mean that the parameter was not found, the use of the detection limit substitution for a large number of "less than detection" values may result in averages biased on the high side

- substitution of zero for values coded as "less than the analytical detection limit" was rejected because of the downward bias on the averages

- reportable loadings result from concentrations around RMDL values when high flows are involved

- intake water analysis data are included in site tables and plots but should be interpreted with caution as being semi-quantitative because of the low number of samples in some cases and because parameter concentration values close to the RMDL are uncertain.

- intake water analysis for a given plant along the St. Clair River may be impacted by the relative close proximity of upstream effluents discharged from other sources or from upstream effluent discharges from the same plant.

- where plant intake water flows were not provided, the average intake flow was set equal to the average sum of the reported plant effluent flows including once-through cooling water.

- information on the number of values reported for each parameter, monthly average concentration, flow and loading values is available from the MISA office in a document entitled "Organic Chemical Manufacturing Sector Six-Month Data Tables (October 1, 1989 to March 31, 1990)", August 1991.

TABLE 1 OCM Sector Plant Overview (by receiving water)

Plant Name	Location	No. of Emp	Major Raw Materials	Intermediate & Final Products	End of Pipe Treatment	No. of Outfalls
St. Clair River						
Akzo Chemicals	Sarnia	17	Isopropyl Alcohol, Tallow Amines Halogenated Tallow Fatty Acids Methyl Chloride, Dimethyl Sulphate	Fabric Softeners, Defoamers, Slip Agents	Biological @ Polysar	1
BASF Canada	Sarnia	90	Styrene Butadiene	Styrene–Butadiene Latex (for paper coating, carpet backing pressure sensitive adhesives)	Biological @ Polysar	2
Chinook Group	Sombra	50	Methanol, Ammonia, Methyl Formate, Hydrochloric Acid, Ethylene Oxide	Amines, Dimethyl Formamide solvent, Choline Chloride poultry feed	Settling and Spray Irrigation	1
Dow	Sarnia	1000	Ethylene Benzene Hexane Butadiene Brine	Chlorine, Caustic Soda, Hydrochloric Acid, Ethylene Dichoride, Vinyl Chloride, Chlorinated Solvents, Propylene Oxide and its derivatives, Ethylbenzene, Styrene, Polystyrene, high & low density Polyethylene, Styrene/Butadiene Latex, Epoxy Resins	Biological	10
Dupont	Corunna	260	Ethylene, Cyclohexane, Butene, Octene	linear low density and high density Polyethylene	Settling and Oil Skimming	1
Esso	Sarnia	600	Vinyl Chloride Monomer, Ethylene, Butene, Hexene, Aromatic Reformate	Polyvinyl Chloride, high & low density Polyethylene, Naphtha, higher olefins Benzene, Toluene, Xylene	Oil Separation Dual Media Filtration Activated Carbon Adsorption	1
Ethyl	Sarnia	120	Lead, Sodium, Ethylene, Hydrogen Chloride	Tetraethyl Lead, Ethyl Chloride, Aluminum Alkyls, diesel ignition improver	Settling, Chemical Reduction, Precipitation, Filtration	1
Novacor	Mooretown	200	Ethylene, Butene, Hexene	high & low density Polyethylene	Settling, Filtration	1
Polysar	Sarnia	2000	crude Butadiene, Benzene, Ethylene Butene, Isoprene, Methyl Chloride, Isopropyl alcohol, Acetonitrile Hexane, Chlorine Bromine, Acrylonitrile, Cyclohexane	Butadiene, Ethylbenzene, Styrene Isobutylene, Tertiary Butyl alcohol, Rubbers : Polybutadiene, Styrene–Butadiene, Bromobutyl, Chlorobutyl, Butyl, Acrylonitrite–Butadiene	Biological Treatment	7

TABLE 1 (CONT'D) OCM Sector Plant Overview (by receiving water)

Plant Name	Location	No. of Emp	Major Raw Materials	Intermediate & Final Products	End of Pipe Treatment	No. of Outfalls
Lake Erie / Ontario Basin						
B.F. Goodrich	Welland (Welland River)	215	Vinyl Chloride, Trichloroethylene	Polyvinyl Chloride (PVC)	Biological Treatment	1
Canadianoxy	Fort Erie (Niagara River)	40	Phenol, Formaldehyde	Phenol–Formaldehyde resins	Municipal Treatment	1
Celanese	Millhaven (Lake Ontario)	630	Ethylene Glycol, Terephthalic Acid	Polyster staple and yarn	Biological Treatment	3
Dupont	Kingston (Lake Ontario)	2000	Adipic Acid, Hexamethylene Diamine	Nylon staple, yarn and resin	Trickling Filter, Municipal Treatment	2
G.E. Plastics	Coburg (Lake Ontario)	140	Acrylonitrile, Styrene, Polybutadiene latex, Pigments	Acrylonitrile–Butadiene–Styrene (ABS) resins	Biological Treatment	2
Stepan	Longford Mills (Lake St. John)	70	linear Alkyl Benzenes, detergent alcohols, Sulphur, Phenol, Nonene, Ethylene Oxide, Ethanolamines, natural long chain oils and fatty acids	detergent bases, wetting agents, emulsifying agents	Biological Treatment	1
Uniroyal	Elmira (Grand River)	250	Acetoacetanilide, Ammonia, Toluene, Sulphuryl Chloride, Morpholine, Decene Mercaptobenzothiazole, Acetaldehyde, substituted Diisocyanates, Butene Diols, Aniline, Acetone	rubber accelerators and antioxidants, seed fumigants, fungicides, food flavoring agents Polyurethane prepolymers, synthetic oils	Biological Treatment, Activated Carbon Adsorption, Ultraviolet, Municipal Treatment	4
St. Lawrence River						
Cornwall Chemicals	Cornwall	70	Sulphur, Chlorine, Natural Gas	Carbon Disulphide, Carbon Tetrachloride	None	1
Courtaulds	Cornwall	400	wood pulp, Caustic Soda, Zinc, Carbon Disulphide, Sulphuric Acid	Rayon staple, Anhydrous Sodium Sulphate	None	6
Dupont	Maitland	725	Cyclohexane, Nitric Acid, Adiponitrile, Ammonia, Hydrogen Fluoride, Carbon Tetrachloride, Chloroform, Tetrachloroethylene, Chlorine, substituted Diisocyanate, Glycol Anthraquinone, Hydrocarbon Solvent	Adipic Acid, Hexamethylene, Diamine, Hydrogen Peroxide, Chlorofluorocarbons, Spandex fibre, engineering resins, Hydrochloric Acid, Hydrogen	Biological Treatment Oil Separation	1
Rohm & Haas	Morrisburg	140	Methyl Methacrylate, Acrylic polymer granules, Methacrylic Acid Esters	acrylic sheet oil additives	Oil Separation	1

Table 2
Matrix of Parameters Found in Plant Effluents By Receiving Water

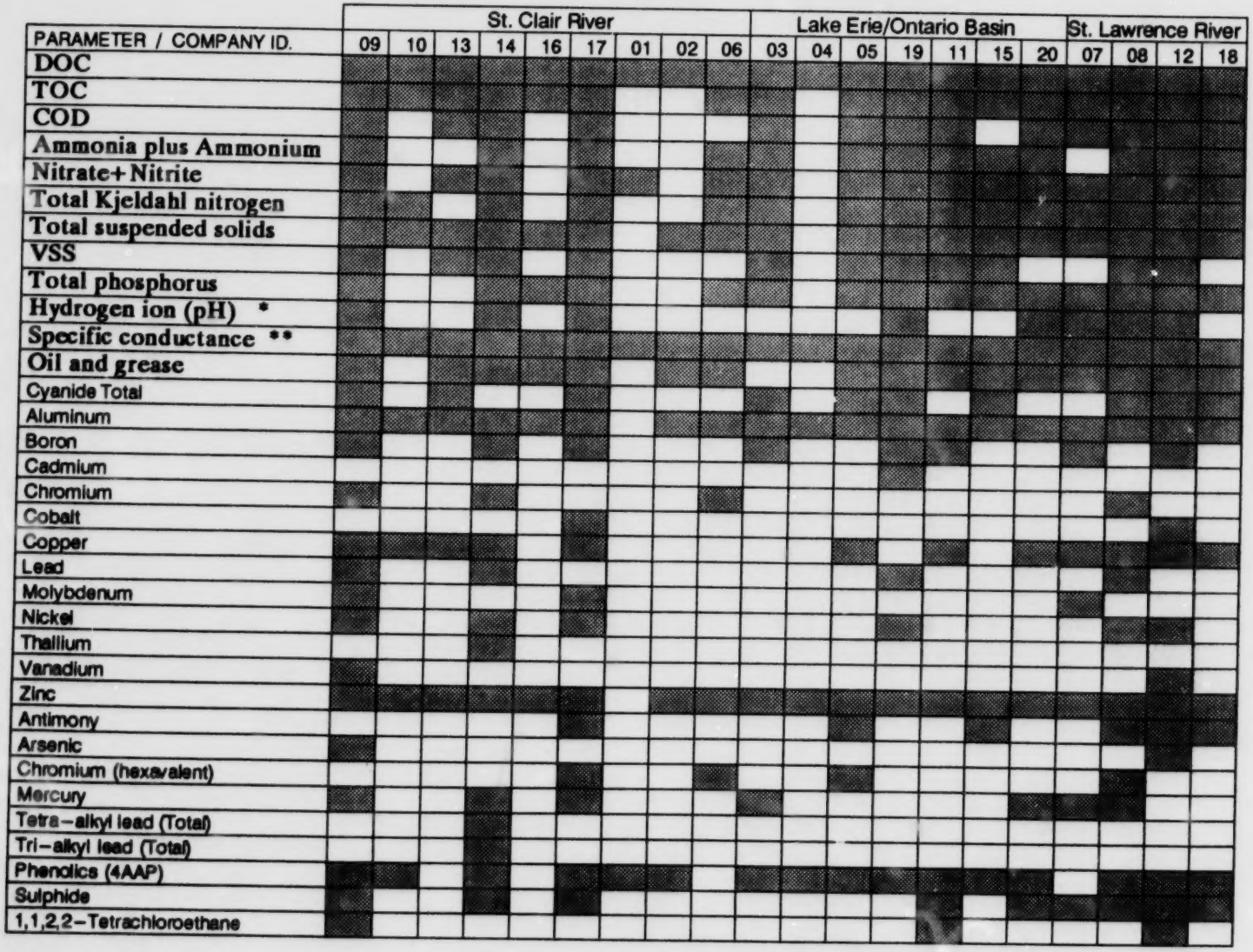


Table 2 (cont'd)
Matrix of Parameters Found in Plant Effluents By Receiving Water

	St. Clair River									Lake Erie/Ontario Basin							St. Lawrence River			
PARAMETER / COMPANY ID.	09	10	13	14	16	17	01	02	06	03	04	05	19	11	15	20	07	08	12	18
1,1,2–Trichloroethane	■													■					■	
1,1–Dichloroethane	■			■								■		■					■	
1,1–Dichloroethylene	■																		■	
1,2–Dichlorobenzene																			■	
1,2–Dichloroethane	■			■								■		■					■	
1,2–Dichloropropane	■													■					■	
1,3–Dichlorobenzene																			■	
1,4–Dichlorobenzene																			■	
Bromodichloromethane	■		■											■			■		■	■
Bromoform	■					■								■					■	
Bromomethane						■								■					■	
Carbon tetrachloride	■												■				■		■	
Chlorobenzene														■					■	
Chloroform	■		■	■		■				■		■	■	■		■	■	■	■	■
Chloromethane	■			■		■						■		■			■		■	
Cis–1,3–Dichloropropylene														■					■	
Dibromochloromethane														■					■	■
Ethylene dibromide				■										■					■	
Methylene chloride	■			■		■						■		■		■	■		■	
Tetrachloroethylene	■													■			■		■	
Trans–1,2–Dichloroethylene																			■	
Trans–1,3–Dichloropropylene														■					■	
Trichloroethylene	■									■							■		■	
Trichlorofluoromethane														■					■	
Vinyl chloride	■									■				■					■	
Benzene	■		■			■				■		■	■	■					■	
Ethylbenzene	■					■		■						■					■	■
Styrene						■		■						■					■	
Toluene		■	■	■		■				■		■	■	■		■			■	■
m–Xylene and p–Xylene			■																■	■
o–Xylene			■											■					■	■
Acrolein														■					■	
Acrylonitrile								■						■					■	
1–Methylnaphthalene				■																
2,6–Dinitrotoluene	■									■										

Table 2 (cont'd)
Matrix of Parameters Found in Plant Effluents By Receiving Water

	St. Clair River									Lake Erie/Ontario Basin							St. Lawrence River			
PARAMETER / COMPANY ID.	09	10	13	14	16	17	01	02	06	03	04	05	19	11	15	20	07	08	12	18
2-Chloronaphthalene	■																			
2-Methylnaphthalene				■																
4-Bromophenyl phenyl ether										■										
5-nitro, Acenaphthene										■										
Benz(a)anthracene										■										
Benzo(a)pyrene										■										
Benzo(b)fluoranthene										■										
Benzo(g,h,i)perylene										■										
Benzo(k)fluoranthene										■										
Benzylbutylphthalate						■				■						■				
Biphenyl	■			■										■					■	
Bis(2-chloroethoxy)methane				■																
Bis(2-chloroethyl)ether	■																			
Bis(2-chloroisopropyl)ether	■																			
Bis(2-ethylhexyl) phthalate	■		■			■				■			■	■		■		■	■	
Camphene										■										
Chrysene										■										
Di-n-butyl phthalate	■																			
Di-n-octyl phthalate				■		■												■		
Diphenyl ether														■					■	
Fluoranthene										■										
Indole				■																
N-Nitrosodi-n-propylamine	■																			
Naphthalene	■																			■
Phenanthrene	■									■										
Pyrene										■										
2,3,4,5-Tetrachlorophenol	■		■	■																
2,3,4-Trichlorophenol	■		■																	
2,4-Dichlorophenol																				■
2,6-Dichlorophenol						■														
Phenol				■																
m-Cresol				■																
o-Cresol				■																
p-Cresol				■																
1,2,3,4-Tetrachlorobenzene	■																			

Table 2 (cont'd)
Matrix of Parameters Found in Plant Effluents By Receiving Water

	St. Clair River									Lake Erie/Ontario Basin							St. Lawrence River			
PARAMETER / COMPANY ID.	09	10	13	14	16	17	01	02	06	03	04	05	19	11	15	20	07	08	12	18
1,2,3,5–Tetrachloroberzene	■									■			■							
1,2,3–Trichloroberzene	■																	■		
1,2,4,5–Tetrachloroberzene	■											■							■	
1,2,4–Trichloroberzene	■					■												■	■	
2,4,5–Trichlorotoluene	■		■			■											■	■	■	
Hexachlorobenzene	■					■											■		■	
Hexachlorobutadiene	■		■			■											■			
Hexachlorocyclopentadiene	■																■		■	
Hexachloroethane	■		■																	
Octachlorostyrene	■																	■		
Pentachloroberzene	■					■								■					■	
2,3,7,8 TCDD	■													■					■	
Octachlorodibenzo–p–dioxin	■									■				■					■	
Octachlorodibenzofuran	■													■		■			■	
Total H6CDD	■																			
Total H6CDF	■													■						
Total H7CDD	■															■				
Total H7CDF	■																		■	
Total PCDD	■																			
Total PCDF	■													■					■	
Total TCDD	■													■					■	
Total TCDF	■												■							
PCBT	■																			

Note: (i) Shading indicates found parameters.
(ii) Parameters found may include any pass–through parameters from intake water.
(See tables in Appendices D, E and F for parameter sources)
* – Shading for pH signifies daily readings outside of range 6.5 to 8.5 (may refer to internal stream or final discharge).
** – Trigger values of 5 uS/cm compares the effluents to laboratory conductivity (ultra pure) water.

01 – Akzo
02 – BASF (S)
03 – B.F. Goodrich
04 – Canadianoxy
05 – Celanese
06 – Chinook
07 – Cornwall Chemicals
08 – Courtaulds Fibres
09 – Dow Chemical
10 – Du Pont (C)
11 – Du Pont (K)
12 – Du Pont (M)
13 – Esso Chemical
14 – Ethyl
15 – GE Plastics
16 – Novacor
17 – Polysar
18 – Rohm and Haas (M)
19 – Stepan
20 – Uniroyal

Table 3 – The Top Nine OCM Sector Discharges of Conventional/Metal Contaminants
All results in kg/day

Conventional or Metal Contaminant	St. Clair River								Lake Erie/Ontario Basin						St. Lawrence River			
	Dow Chemical		Esso Chemical		Ethyl		Polysar		Celanese		Du Pont Kingston		GE Plastics		Courtaulds		Du Pont Maitland	
	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In
DOC	2035	2016	217	71	66	–	2019	1812	201	141	279	97	40	–	1799	371	1248	387
Nitrogen * Compounds	896	1098	16	18	94	–	337	555	58	36	126	–	132	–	41	120	1212	133
TSS	6016	3842	197	297	366	–	2219	2778	180	387	385	210	51	–	1211	70	2416	3011
VSS	2688	3728	198	90	301	–	1627	1698	58	284	293	–	51	–	884	70	2078	860
Phosphorus	130	61	–	–	9	–	70	44	7	1	13	4	1	0.5	10	16	37	17
Oil and Grease	1144	1702	46	30	54	–	819	474	70	43	100	42	6	3	942	**	529	179
Cyanide	4	3	0.27	0.14	–	–	0.24	0.47	0.16	0.22	–	–	0.2	***	0.13	0.07	12	1
Aluminum	82	23	2	5	151	–	62	41	3	4	2	1	0.6	0.1	6	8	9	9
Copper	5	2	0.6	0.5	0.6	–	3.3	1.7	0.7	0.3	0.6	1.3	–	–	0.7	0.3	14	2
Zinc	175	2	0.7	0.2	0.3	–	8.2	4	1.8	0.6	0.3	3.4	0.03	0.03	400	10	10	2
Phenolics (4AAP)	2	6	–	–	0.3	–	1.1	0.6	0.06	0.03	0.1	0.04	0.2	***	0.6	0.1	2	0.3
Sulphide	40	45	–	–	1.2	–	17	13	–	–	0.5	0.4	–	–	522	22	1.6	1.7

Note: * Includes Ammonia, Nitrate, and TKN.
** Intake water data suspect.
*** Intake water loading equal to 0.004 kg/day.
– Was not a found parameter or no intake data provided.
Out = Total effluent loadings discharged to watercourse
In = Intake water loadings to site

Table 4 – The Top OCM Sector Dischargers of EMPPL Contaminants
All results in kg/day

		St. Clair River						Lake Erie/Ontario Basin						St. Lawrence River					
	EMPPL	Dow Chemical		Ethyl		Polysar		B.F. Goodrich		Du Pont Kingston		Uniroyal		Cornwall Chemicals		Courtaulds		Du Pont Maitland	
ATG	Contaminant(s)	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In
9	Chromium	5.1	3.7	0.1	*	–	–	–	–	–	–	–	–	–	–	1.4	0.4	–	–
	Lead	26.5	19.8	20	*	–	–	–	–	–	–	–	–	–	–	2.8	0.6	–	–
10	Antimony	–	–	–	–	1.8	1.8	–	–	–	–	–	–	–	–	–	–	1.1	0.3
12	Mercury	0.06	0.06	0.02	*	0.05	0.02	–	–	–	–	–	–	0.003	**	0.12	0.002	–	–
13	Total Alkyl Lead	–	–	1.2	*	–	–	–	–	–	–	–	–	–	–	–	–	–	–
16	Volatiles, Halogenated	27.7	24.4	19.8	*	272	3	0.92	0.01	–	–	–	–	12.8	0.01	0.36	0.03	10.7	3.6
17	Volatiles, non-Halogenated	1	0.7	1.14	*	4.82	1	–	–	–	–	0.19	**	–	–	–	–	0.5	0.2
19	Extractables, Base Neutral	15	10	0.5	*	2.4	1.5	–	–	0.8	–	–	–	–	–	0.8	0.2	–	–
20	Extractables, Acid (Phenolics)	1	0.8	0.4	*	0.5	0.5	–	–	–	–	–	–	–	–	–	–	–	–
23	Extractables, Neutral Chlorinated	0.1	0.06	–	*	0.01	0.01	**	**	–	–	–	–	**	**	–	–	–	–
24	PCDDs and PCDFs (1)	x		–		–		x		x		x		–		–		x	

Note: * No intake data provided.
** Loading for the parameter(s) less than 1 gram/day.
x – See concentration/loading data in the tables in Appendices D, E and F for specific congeners (based on two or more samples).
ATG = Analytical Test Group (Refer to Table A–1 to identify individual parameters in each ATG)
– Was not a found parameter, ATG, or intake/effluent loadings are comparable.
(1) PCDD = Polychlorinated Dibenzo–p–dioxins
PCDF = Polychlorinated Dibenzofurans
Out = Total effluent loadings to water body
In = Intake loadings to site

APPENDIX A

EXPLANATORY NOTES

APPENDIX A - EXPLANATORY NOTES

CONCENTRATION TABLES (Appendices D,E and F)
DEFINITION OF FOUND

The following edit rules were used to determine reportable parameters:

- data for a basic core group of 12 conventional parameters were reported in the six-month tables (Appendices D,E and F) irrespective of concentration levels for all monitored plant effluents. These parameters included:

  DOC, TOC, COD
  Ammonia/Ammonium
  Nitrate/Nitrite
  Total Kjeldahl Nitrogen
  Total Suspended Solids
  VSS
  Total phosphorus
  pH
  Specific Conductance
  Oil & Grease

- other parameters were listed in the six-month tables as found unless a statistical proportion of 0.9 of the CONCENTRATION data results was less than the Regulation Method Detection Limit (RMDL) - referred to as the 90/10 Edit

- for small numbers of samples, the 90/10 edit was modified to include listing of parameters as found unless the following minimum number of values at **less than RMDL** were reported: 2 of 2; 3 of 3; 3 of 4; 3 of 5 or 4 of 6.

- parameters for which only single values were available were not included in the tables

- where a parameter was listed for a stream on the basis of the 90/10 edit, it was also listed for all other streams monitored at the plant site even though the parameter might not have qualified as "found" in those streams

- parameters with reported concentration values less than detection levels, normally considered as non-detected, could be listed as "found" by the 90/10 edit rule for cases where the laboratory detection levels were above RMDL values

- Method Detection Limit (MDL) means the minimum concentration of a parameter necessary to infer its presence in a sample with a level of confidence greater than 99 percent when the concentration is calculated according to the procedure set out in the Effluent Monitoring - General Regulation

- Regulation Method Detection Limit (RMDL) is the maximum allowable MDL for a laboratory providing data under the regulation

- the complete list of monitored parameters together with the RMDL for each parameter is shown in Table A-1, Appendix A

STREAM CODES

- identify the type of streams monitored

IN = intake water to plant site -- may be directly from a natural watercourse or from a municipal supply
PR = process effluent continuously discharged
BA = process effluent intermittently discharged
OT = non-contact cooling water
CO = combined effluent -- a blend of process and non-contact cooling water
WA = process effluent from a waste disposal site

STREAM NUMBERS

- identify individual streams and sampling locations for the site

PARAMETERS

DOC = dissolved organic carbon
TOC = total organic carbon -- includes DOC and solids material if present
COD = chemical oxygen demand -- measure of the amount of oxidizable material
VSS = volatile suspended solids -- solids lost on ignition at 550°C for 4 hours
FTFLOW = stream flow volume discharged per day

CONCENTRATION TABLES

The following table illustrates the relative magnitude of the concentration units used in the UNIT Column with a comparison in terms of units of time to put them in clearer perspective:

mg/L = milligrams/litre = 0.001 grams/litre ($1x10^{-3}$) = parts per million
(1 minute in 2 years)

ug/L = microgram/litre = 0.000001 grams/litre ($1x10^{-6}$) = parts per billion
(1 second in 32 years)

ng/L = nanograms/litre = 0.000000001 grams/litre ($1x10^{-9}$) = parts per trillion
(1 second in 320 centuries)

pg/L = picrograms/litre = 0.000000000001 grams/litre ($1x10^{-12}$) = parts per quadrillion
(1 second in 32 000 millenia)

m^3 = cubic metres = 1000 kg = 220 gallons (Imperial)

uS/cm = microSiemens/centimetre
- typical laboratory conductivity water 5 uS/cm
- normal potable water 100-300 uS/cm
- measure of the dissolved solids in the effluent

CALCULATION OF AVERAGE CONCENTRATION VALUES

- where a concentration value was qualified by the following remark codes it was excluded from the calculations:

I -	Interference suspected
MP -	Multiphase sample
SIP -	Sample improperly preserved
UCR -	Data unreliable; could not confirm by re-analysis
IN -	No data, insufficient volume
NM -	No effluent, no sample

- zero or blank concentration values were omitted from the calculation of averages

- concentration values less than RMDL/10 were converted to RMDL/10 for use in the calculation of averages

LOADING TABLES

CALCULATION OF LOADINGS

(i) Effluents

- daily loadings were calculated as a product of daily flow and daily concentration

- daily loadings were summed over a monthly period and divided by the number of days to produce a monthly average loading

- six-month average loadings were calculated by summing daily data over the six month period and dividing by the number of days

(ii) Intake Water

- intake water sampling and flow measurement were not regulated requirements

- intake sampling ranged from none for two plants up to a level consistent with effluent frequencies but was typically done 6 times over the six- month reporting period by most of the plants

- intake loading was calculated as the product of a daily concentration and the average monthly, 3-month or 6-month flow depending on the frequency of the intake sampling

- where no intake flows were provided, the intake flow was set equal to the sum of the effluent flows

"TOTAL" COLUMN IN THE LOADING TABLE

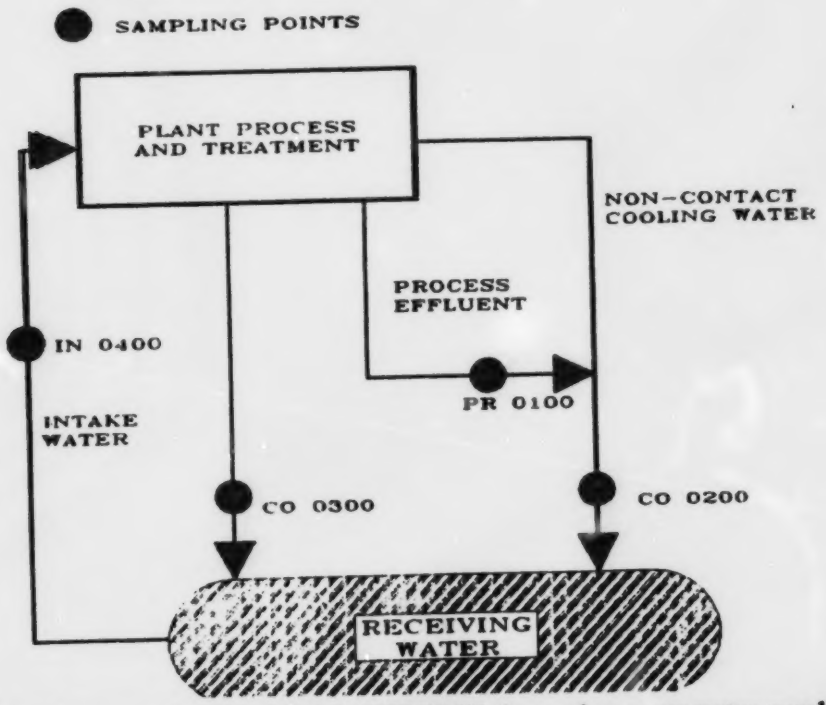
The loading under the TOTAL COLUMN is the total gross loading discharged to the environment from the plant site. Loadings entering the site in the intake water are not subtracted from the plant total but are shown separately in the tables.

For single effluent plants the loading reported in the TOTAL COLUMN is the same as that reported for the single effluent.

For multi-effluent sites the loading in the TOTAL COLUMN is the sum of the loading totals shown for individual plant effluents.

NOTE: In some cases monitoring was carried out on effluents upstream of dilution as well as on the combined streams. The diagram illustrates the case.

TYPICAL FLOW CONTINUITY FOR MULTI-EFFLUENT SITES



The total loading shown under the TOTAL COLUMN for a given parameter would be the the sum of the loading in CO0300 and either one of the two values reported for stream PR0100 or CO0200 if the contaminants were common to both streams. To sum loadings in both PR0100 and CO0200 for the total discharge for the site would be double accounting.

The "SAMPLING POINTS" footnote at the end of each six-month concentration or loading table indicates the destination of each monitored effluent.

DEFINITION OF PWQO/G'S

- a Provincial Water Quality Objective (PWQO) is a numerical or narrative limit recommended to protect all forms of aquatic life during indefinite exposure and to protect recreational water uses

- a Provincial Water Quality Guideline (PWQG) represents the best available limit value when there is not enough information to meet the minimum requirements for setting a PWQO

Table A–1
Regulation Method Detection Limits (RMDL) for all Parameters Monitored by the OCM Sector

ATG	PARAMETER	RMDL	RUNIT	ATG	PARAMETER	RMDL	RUNIT
5	DOC	0.500	mg/L	16	1,3–Dichlorobenzene	1.100	ug/L
5	TOC	5.000	mg/L	16	1,4–Dichlorobenzene	1.700	ug/L
1	COD	10.000	mg/L	16	Bromodichloromethane	0.800	ug/L
4	Ammonia plus Ammonium	0.250	mg/L	16	Bromoform	3.700	ug/L
4	Nitrate+Nitrite	0.250	mg/L	16	Bromomethane	3.700	ug/L
4	Total Kjeldahl nitrogen	0.500	mg/L	16	Carbon tetrachloride	1.300	ug/L
8	Total suspended solids	5.000	mg/L	16	Chlorobenzene	0.700	ug/L
8	VSS	10.000	mg/L	16	Chloroform	0.700	ug/L
6	Total phosphorus	0.100	mg/L	16	Chloromethane	3.700	ug/L
3	Hydrogen ion (pH)			16	Cis–1,3–Dichloropropylene	1.400	ug/L
7	Specific conductance		uS/cm	16	Dibromochloromethane	1.100	ug/L
2	Cyanide Total	0.005	mg/L	16	Ethylene dibromide	1.000	ug/L
9	Aluminum	30.000	ug/L	16	Methylene chloride	1.300	ug/L
9	Beryllium	10.000	ug/L	16	Tetrachloroethylene	1.100	ug/L
9	Boron	50.000	ug/L	16	Trans–1,2–Dichloroethylene	1.400	ug/L
9	Cadmium	2.000	ug/L	16	Trans–1,3–Dichloropropylene	1.400	ug/L
9	Chromium	20.000	ug/L	16	Trichloroethylene	1.900	ug/L
9	Cobalt	20.000	ug/L	16	Trichlorofluoromethane	1.000	ug/L
9	Copper	10.000	ug/L	16	Vinyl chloride	4.000	ug/L
9	Lead	30.000	ug/L	17	Benzene	0.500	ug/L
9	Molybdenum	20.000	ug/L	17	Ethylbenzene	0.600	ug/L
9	Nickel	20.000	ug/L	17	Styrene	0.500	ug/L
9	Silver	30.000	ug/L	17	Toluene	0.500	ug/L
9	Thallium	30.000	ug/L	17	m–Xylene	1.100	ug/L
9	Vanadium	30.000	ug/L	17	m–Xylene and p–Xylene	1.100	ug/L
9	Zinc	10.000	ug/L	17	o–Xylene	0.500	ug/L
10	Antimony	5.000	ug/L	17	p–Xylene	1.100	ug/L
10	Arsenic	5.000	ug/L	18	Acrolein	4.000	ug/L
10	Selenium	5.000	ug/L	18	Acrylonitrile	4.200	ug/L
11	Chromium (hexavalent)	10.000	ug/L	19	1–Chloronaphthalene	2.500	ug/L
12	Mercury	0.100	ug/L	19	1–Methylnaphthalene	3.200	ug/L
13	Tetra–alkyl lead (Total)	2.000	ug/L	19	2,4–Dinitrotoluene	0.800	ug/L
13	Tri–alkyl lead (Total)	2.000	ug/L	19	2,6–Dinitrotoluene	0.700	ug/L
14	Phenolics (4AAP)	2.000	ug/L	19	2–Chloronaphthalene	1.800	ug/L
15	Sulphide	20.000	ug/L	19	2–Methylnaphthalene	2.200	ug/L
16	1,1,2,2–Tetrachloroethane	4.300	ug/L	19	4–Bromophenyl phenyl ether	0.300	ug/L
16	1,1,2–Trichloroethane	0.600	ug/L	19	4–Chlorophenyl phenyl ether	0.900	ug/L
16	1,1–Dichloroethane	0.800	ug/L	19	5–nitro, Acenaphthene	4.300	ug/L
16	1,1–Dichloroethylene	2.800	ug/L	19	Acenaphthene	1.300	ug/L
16	1,2–Dichlorobenzene	1.400	ug/L	19	Acenaphthylene	1.400	ug/L
16	1,2–Dichloroethane	0.800	ug/L	19	Anthracene	1.200	ug/L
16	1,2–Dichloropropane	0.900	ug/L	19	Benz(a)anthracene	0.500	ug/L

Table A-1 (cont'd)
Regulation Method Detection Limits (RMDL) for all Parameters Monitored by the OCM Sector

ATG	PARAMETER	RMDL	RUNIT	ATG	PARAMETER	RMDL	RUNIT
19	Benzo(a)pyrene	0.600	ug/L	20	2,4-Dinitrophenol	42.000	ug/L
19	Benzo(b)fluoranthene	0.700	ug/L	20	2,6-Dichlorophenol	2.000	ug/L
19	Benzo(g,h,i)perylene	0.700	ug/L	20	2-Chlorophenol	3.700	ug/L
19	Benzo(k)fluoranthene	0.700	ug/L	20	4,6-Dinitro-o-cresol	24.000	ug/L
19	Benzylbutylphthalate	0.600	ug/L	20	4-Chloro-3-methylphenol	1.500	ug/L
19	Biphenyl	0.600	ug/L	20	4-Nitrophenol	1.400	ug/L
19	Bis(2-chloroethoxy)methane	3.500	ug/L	20	Pentachlorophenol	1.300	ug/L
19	Bis(2-chloroethyl)ether	4.400	ug/L	20	Phenol	2.400	ug/L
19	Bis(2-chloroisopropyl)ether	2.200	ug/L	20	m-Cresol	3.400	ug/L
19	Bis(2-ethylhexyl) phthalate	2.200	ug/L	20	o-Cresol	3.700	ug/L
19	Camphene	3.500	ug/L	20	p-Cresol	3.500	ug/L
19	Chrysene	0.300	ug/L	23	1,2,3,4-Tetrachlorobenzene	10.000	ng/L
19	Di-n-butyl phthalate	3.800	ug/L	23	1,2,3,5-Tetrachlorobenzene	10.000	ng/L
19	Di-n-octyl phthalate	2.000	ug/L	23	1,2,3-Trichlorobenzene	10.000	ng/L
19	Dibenz(a,h)anthracene	1.300	ug/L	23	1,2,4,5-Tetrachlorobenzene	10.000	ng/L
19	Diphenyl ether	0.400	ug/L	23	1,2,4-Trichlorobenzene	10.000	ng/L
19	Diphenylamine	14.000	ug/L	23	2,4,5-Trichlorotoluene	10.000	ng/L
19	Fluoranthene	0.400	ug/L	23	Hexachlorobenzene	10.000	ng/L
19	Fluorene	1.700	ug/L	23	Hexachlorobutadiene	10.000	ng/L
19	Indeno(1,2,3-cd)pyrene	1.300	ug/L	23	Hexachlorocyclopentadiene	10.000	ng/L
19	Indole	1.900	ug/L	23	Hexachloroethane	10.000	ng/L
19	N-Nitrosodi-n-propylamine	3.100	ug/L	23	Octachlorostyrene	10.000	ng/L
19	N-Nitrosodiphenylamine	14.000	ug/L	23	Pentachlorobenzene	10.000	ng/L
19	Naphthalene	1.600	ug/L	24	2,3,7,8 TCDD	20.000	pg/L
19	Perylene	1.500	ug/L	24	Octachlorodibenzo-p-dioxin	30.000	pg/L
19	Phenanthrene	0.400	ug/L	24	Octachlorodibenzofuran	30.000	pg/L
19	Pyrene	0.400	ug/L	24	Total H6CDD	30.000	pg/L
20	2,3,4,5-Tetrachlorophenol	0.400	ug/L	24	Total H6CDF	20.000	pg/L
20	2,3,4,6-Tetrachlorophenol	2.800	ug/L	24	Total H7CDD	30.000	pg/L
20	2,3,4-Trichlorophenol	0.600	ug/L	24	Total H7CDF	30.000	pg/L
20	2,3,5,6-Tetrachlorophenol	1.600	ug/L	24	Total PCDD	20.000	pg/L
20	2,3,5-Trichlorophenol	1.300	ug/L	24	Total PCDF	15.000	pg/L
20	2,4,5-Trichlorophenol	1.300	ug/L	24	Total TCDD	20.000	pg/L
20	2,4,6-Trichlorophenol	1.300	ug/L	24	Total TCDF	15.000	pg/L
20	2,4-Dichlorophenol	1.700	ug/L	25	Oil and grease	1.000	mg/L
20	2,4-Dimethylphenol	7.300	ug/L	27	PCBT	0.100	ug/L

TABLE A-2 SUMMARY OF AVAILABLE PWQO/G - JULY 1991

SUBSTANCE	CAS NUMBER	EMPPL LIST.	PWQO STATUS	VALUE (µg/L)
1,1,2,2-tetrachloroethane	79345	/87	PROPOSED PWQG	50
1,1,2-trichloroethane	79005	/87	PROPOSED PWQG	800
1,1-dichloroethane	75343	/87	PROPOSED PWQG	200
1,1-dichloroethylene	75354	/87	PROPOSED PWQG	40
1,2,3,4-tetrachlorobenzene	634662	/87	PWQO	0.1
1,2,3,5-tetrachlorobenzene	634902	/87	PWQO	0.1
1,2,3-trichlorobenzene	87616	/87	PWQO	0.9
1,2,4,5-tetrachlorobenzene	95943	/87	PWQO	0.15
1,2,4-trichlorobenzene	120821	/87	PWQO	0.5
1,2-dichlorobenzene	95501	/87	PWQO	2.5
1,2-dichloroethane	107062	/87	PROPOSED PWQG	90
1,3-dichlorobenzene	541731	/87	PWQO	2.5
1,4-dichlorobenzene	106467	/87	PWQO	4
1-methylnaphthalene	90120	/87	PROPOSED PWQG	2
2,3,4,5-tetrachlorophenol	4901513	/87	PWQO	1
2,3,4,6-tetrachlorophenol	58902	/87	PWQO	1
2,3,4-trichlorophenol	15950660	/87	PWQO	18
2,3,5,6-tetrachlorophenol	935955	/87	PWQO	1
2,3,5-trichlorophenol	933788	/87	PWQO	18
2,3,7,8-tetrachlorodibenzo-p-dioxin	1746016	/87	PROPOSED PWQG	0.1 pg/L
2,4,5-trichlorophenol	95954	/87	PWQO	18
2,4,6-trichlorophenol	88062	/87	PWQO	18
2,4-dichlorophenol	120832	/87	PWQO	0.2
2,4-dimethylphenol	105679	/87	PROPOSED PWQG	10.5
2,4-dinitrotoluene	121142	/87	PROPOSED PWQG	4
2,6-dichlorophenol	87650	/87	PWQO	0.2
2,6-dimethylphenol	576261	/88	PROPOSED PWQG	8.4
2,6-dinitrotoluene	606202	/87	PROPOSED PWQG	3
2-methylnaphthalene	91576	/87	PROPOSED PWQG	2
2-nitrophenol	88755	/88	PROPOSED PWQG	0.5
3,4-dimethylphenol	95658	/88	PROPOSED PWQG	17.5
4,6-dinitro-o-cresol	534521	/87	PROPOSED PWQG	0.2
4-nitrophenol	100027	/87	PROPOSED PWQG	48
abietic acid	514103	/87	PWQG (j)	(a), (j)
aluminum	7429905	/87	PWQG	(a)
aniline	62533	/87	PROPOSED PWQG	2
antimony	7440360	/87	PROPOSED PWQG	7
Arocior 1016*	12674112	/87	PWQO (j)	(j)
Arocior 1221*	11104282	/87	PWQO (j)	(j)
Arocior 1232*	11141165	/87	PWQO (j)	(j)
Arocior 1242*	53469219	/87	PWQO (j)	(j)
Arocior 1248*	12672296	/87	PWQO (j)	(j)
Arocior 1254*	11097691	/87	PWQO (j)	(j)
Arocior 1260*	11096825	/87	PWQO (j)	(j)
arsenic	7440382	/87	PWQO	100
benzene	71432	/87	PROPOSED PWQG	100

TABLE A-2 (cont'd.) SUMMARY OF AVAILABLE PWQO/G - JULY 1991

SUBSTANCE	CAS NUMBER	EMPPL LIST.	PWQO STATUS	VALUE (µg/L)
beryllium	7440417	/87	PWQO	(a)
bis(2-ethylhexyl)phthalate	117817	/87	PWQO (f)	(f)
cadmium	7440439	/87	PWQO	0.2
cadmium (revised)	7440439	/87	PROPOSED PWQO	(a)
chlorobenzene (monochlorobenzene)	108907	/87	PWQO	15
chromium	7440473	/87	PWQO	100
cis-1,2-dichloroethylene	156592	/87	PROPOSED PWQG	200
cobalt	7440484	/87	PROPOSED PWQG	0.4
copper	7440508	/87	PWQO	5
copper (revised)	7440508	/87	PROPOSED PWQO	(a)
dehydroabietic acid	1740198	/87	PWQG	(a)
Di-n-butylphthalate	84742	/87	PWQO (g)	(g)
di-n-octylphthalate	117840	/88	PWQO	(h)
diethylphthalate (DEP)	84662	/88	PWQO	(h)
dimethylphenols (Isomer Nonspecific)	1300716	/88	PROPOSED PWQG	(c)
dimethylphthalate	131113	/89	PWQO	(h)
ethylbenzene	100414	/88	PROPOSED PWQG	8
hexachlorobenzene	118741	/87	PWQO	0.0065
hexachlorobutadiene	87683	/87	PROPOSED PWQG	0.02
hydrogen sulphide	7783064	/88	PWQO	2
isopimaric acid	5835267	/87	PWQG (j)	(a), (j)
lead	7439921	/87	PWQO	(a)
lead (revised)	7439921	/87	PROPOSED PWQO	(a)
levopimaric acid	79549	/87	PWQG (j)	(a), (j)
Lindane (gamma - 1,2,3,4,5,6-hexachlorocyclohexane)	58899	/88	PWQO	0.01
m-cresol	108394	/87	PROPOSED PWQG	1
m-xylene	108383	/87	PROPOSED PWQG	2
mercury	7439976	/87	PWQO	0.2
neoabietic acid	471772	/87	PWQG (j)	(a), (j)
nickel	7440020	/87	PWQO	25
nitrobenzene	98953	/88	PROPOSED PWQG	0.02
o-chlorophenol (2-chlorophenol)	95578	/87	PWQO	(d)
o-cresol	95487	/87	PROPOSED PWQG	1
o-xylene	95476	/87	PROPOSED PWQG	0.7
p-cresol	106445	/87	PROPOSED PWQG	1
p-xylene	106423	/87	PROPOSED PWQG	30
pentachlorobenzene	608935	/87	PWQO	0.03
pentachlorophenol	87865	/87	PWQO	0.5
phenols	108952	/87	PWQO	1
pimaric acid	127275	/87	PWQG (j)	(a), (j)
selenium	7782492	/87	PWQO	100
silver	7440224	/87	PWQO	0.1
STRONTIUM	7440246	/88	PROPOSED PWQG	7
Styrene	100425	/87	PROPOSED PWQG	20

TABLE A-2 (cont'd.) SUMMARY OF AVAILABLE PWQO/G - JULY 1991

SUBSTANCE	CAS NUMBER	EMPPL LIST.	PWQO STATUS	VALUE (µg/L)
Tetrachloroethylene	127184	/87	PROPOSED PWQG	50
Tetraethyl lead	78002	/87	PROPOSED PWQG	0.0009
Thallium	7440280	/87	PROPOSED PWQG	0.2
Toluene	108883	/87	PROPOSED PWQG	0.8
trans-1,2-Dichloroethylene	156605	/87	PROPOSED PWQG	200
Trichloroethylene	79016	/87	PROPOSED PWQG	2
Triethyl lead		/87	PROPOSED PWQG	0.4
Vanadium	7440622	/87	PROPOSED PWQG	7
Zinc	7440666	/87	PWQO	16

LEGEND

(a) PWQO/G is either a narrative, or dependent on pH, alkalinity, or hardness; see Blue Book Table 1 and addenda, and table below

(b) proposed PWQG's are under development for 2,3,7,8-T4CDD and 2,3,7,8-T4CDF only

(c) proposed PWQG's are available for some isomers of dimethylphenol

(d) PWQO is for MONOCHLOROPHENOL (7 µg/L)

(f) PWQO is for DIETHYLHEXYLPHTHALATE (0.6 µg/L)

(g) PWQO is for DIBUTYLPHTHALATE (4.0 µg/L)

(h) PWQO is for OTHER PHTHALATES (0.2 µg/L)

(j) PWQO/G is available for total PCB's, for total resin acids and for DHA, but not other individual isomers

PWQG = Provincial Water Quality Guideline

PWQO = Provincial Water Quality Objective

PARAMETER	PROVINCIAL WATER QUALITY GUIDELINE
ALUMINUM, INORGANIC MONOMERIC	0.015 mg/L, at pH 4.5 to 5.5 measured in clay-free samples
ALUMINUM, ACID SOLUBLE INORGANIC	<10% increase above avge. background at pH>5.5-6.5 in clay free samples
ALUMINUM, TOTAL	0.075 mg/L at pH 6.5-9.0 measured in clay free samples
DHA	see footnote 1
PHOSPHORUS, TOTAL	To avoid nuisance algae concentrations in lakes, total P should not exceed 20 µg/L
	To protect against aesthetic deterioration in lakes, total P should not exceed10 µg/L
	To avoid excess plant growth in rivers & streams, total P should not exceed 30 µg/L
RESIN ACIDS, TOTAL	see footnote 1

(1) Total resin acids and DHA are pH dependent as shown below:

Receiving water pH	DHA (µg/L)	Total Resin Acids (µg/L)
5	1.0	1.0
5.5	1.9	2.7
6	2.5	4.2
6.5	4.2	9.3
7	8.0	25.0
7.5	11.8	45.4
8	12.9	52.4
8.5	14.0	59.8
9	14.3	61.5

PROPOSED METAL PWQO/G		
SUBSTANCE	HARDNESS (mg/L)	PROPOSED PWQO/G (µg/L)
CADMIUM	0 - 100	0.15
	> 100	0.45
COPPER	0 - 20	1
	> 20	5
LEAD	0 -30	1
	30 -80	3
	> 80	5

APPENDIX B

PLOTS OF SIX-MONTH AVERAGE SITE FLOWS/LOADINGS

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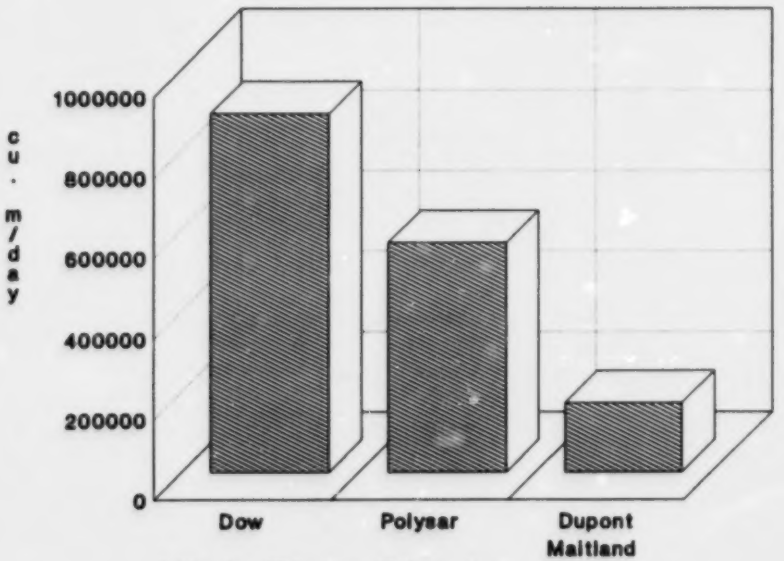
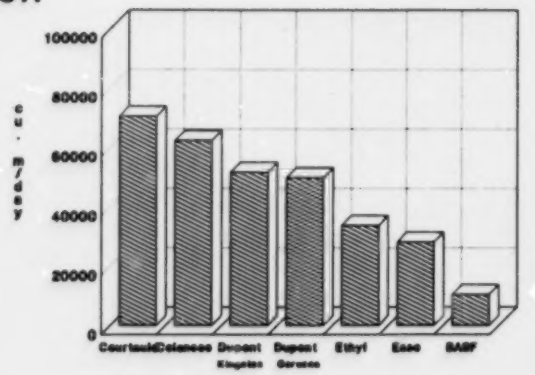
Figure B-1
OCM Sector - Relative Plant Flow Comparison

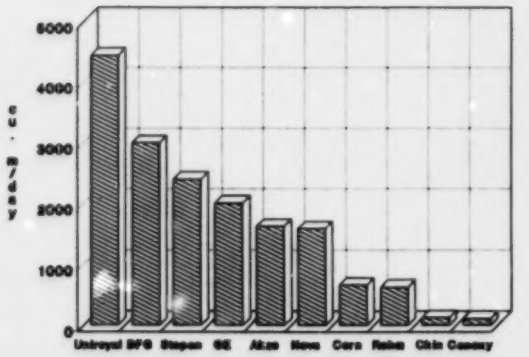
(Based on six-month average data)



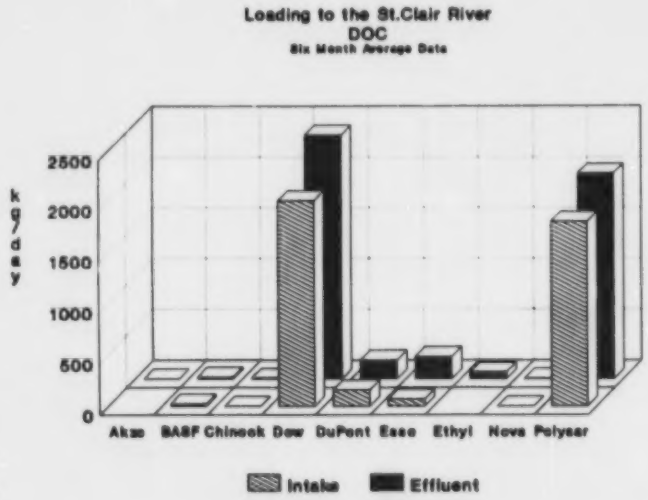
High Flow Plants

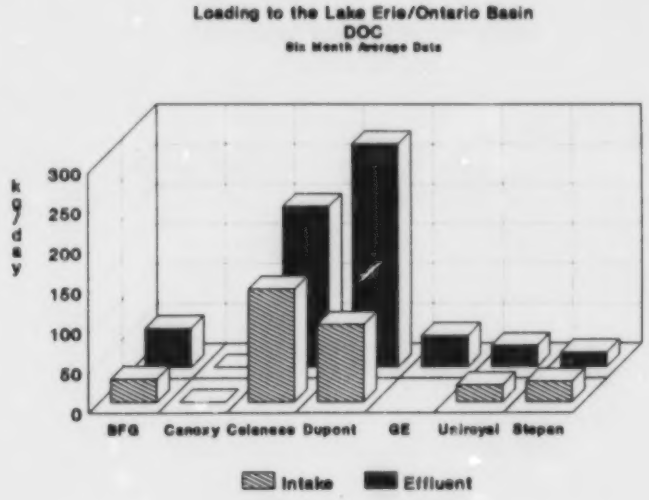


Medium Flow Plants



Low Flow Plants





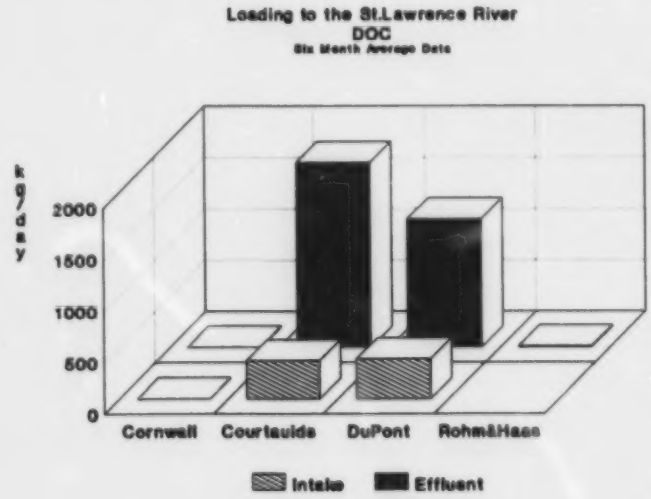
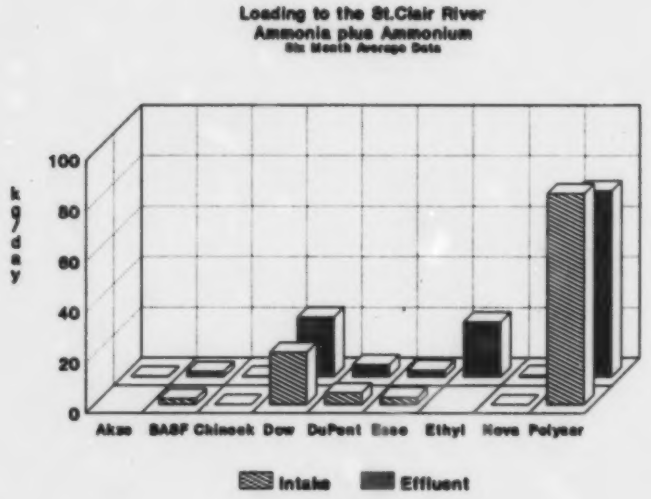
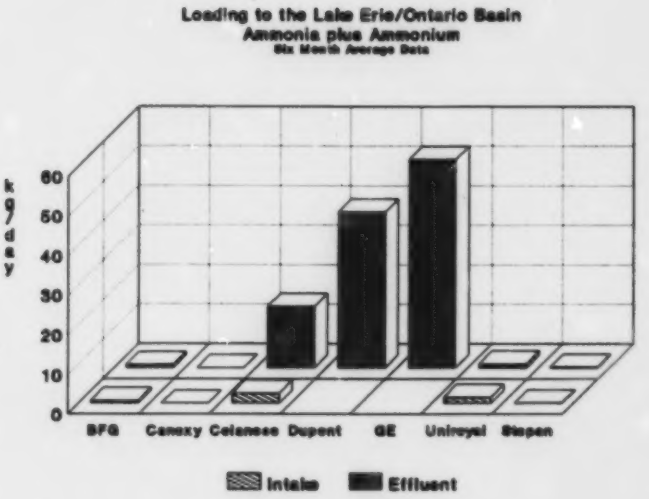


Figure B-2 DOC

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





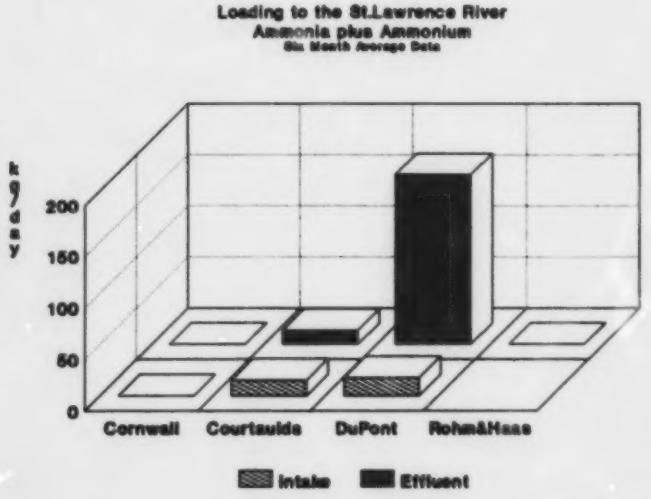
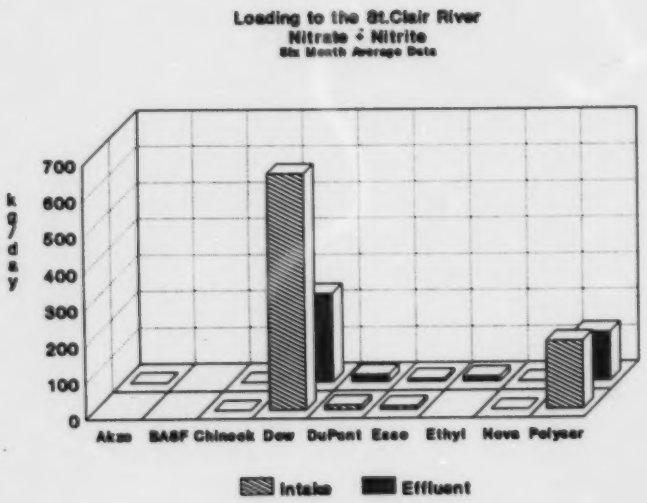
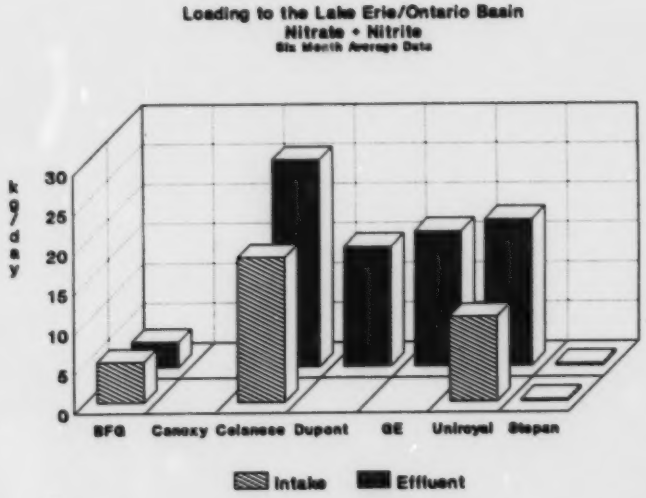


Figure B-3 Ammonia/Ammonium

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





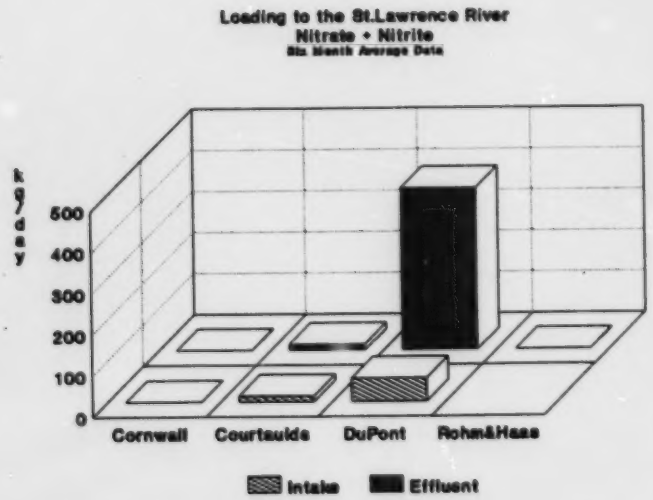
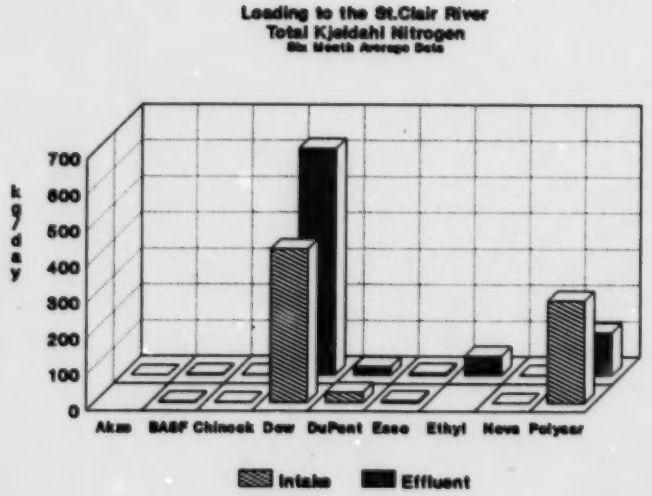
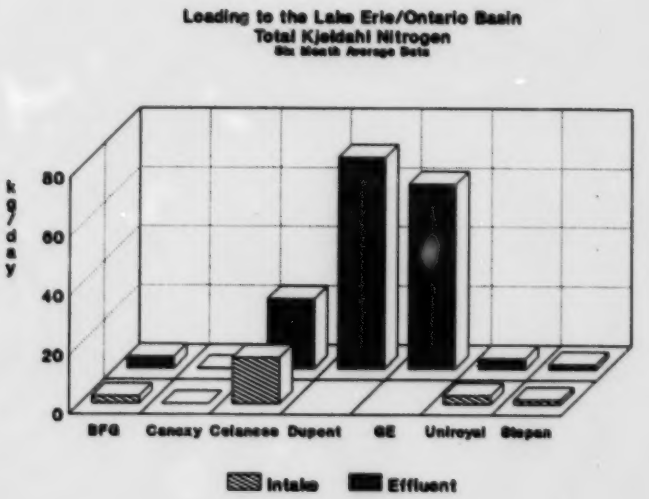


Figure B-4 Nitrate/Nitrite

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





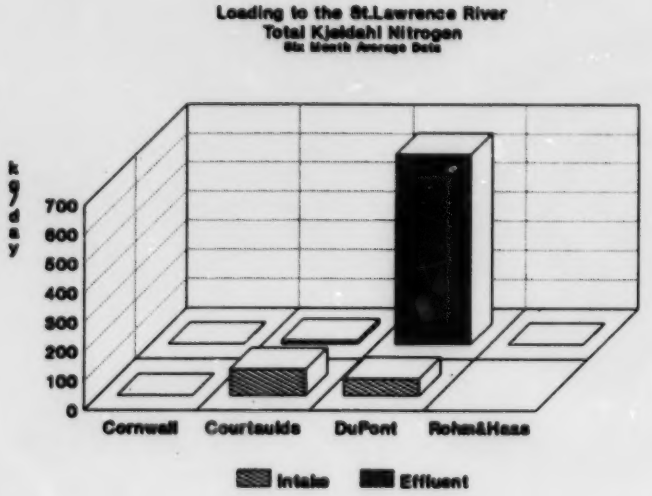
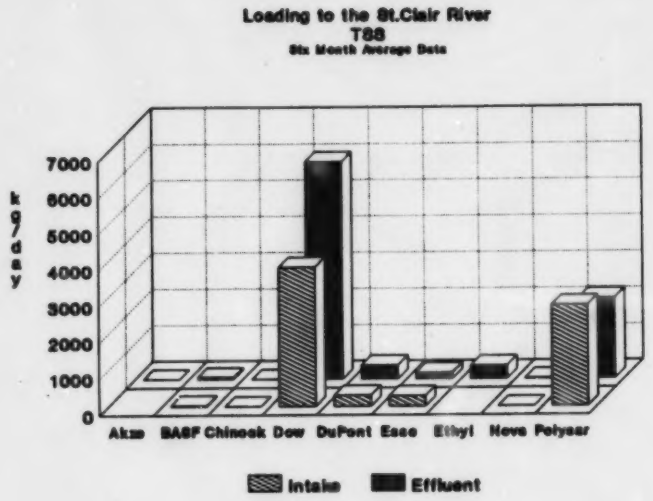
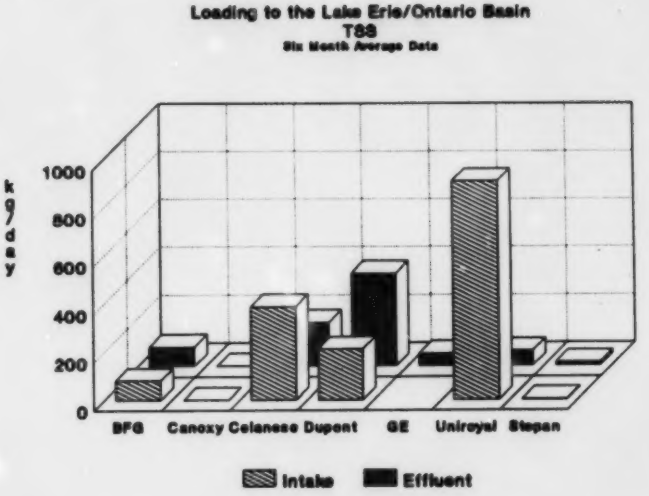


Figure B-5 Total Kjeldahl Nitrogen

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





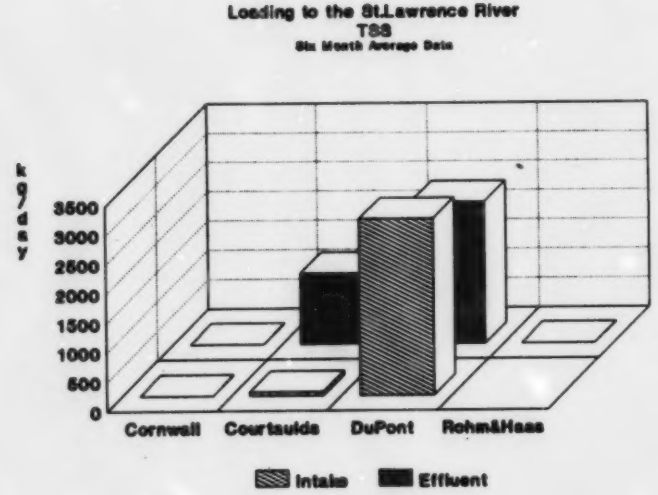
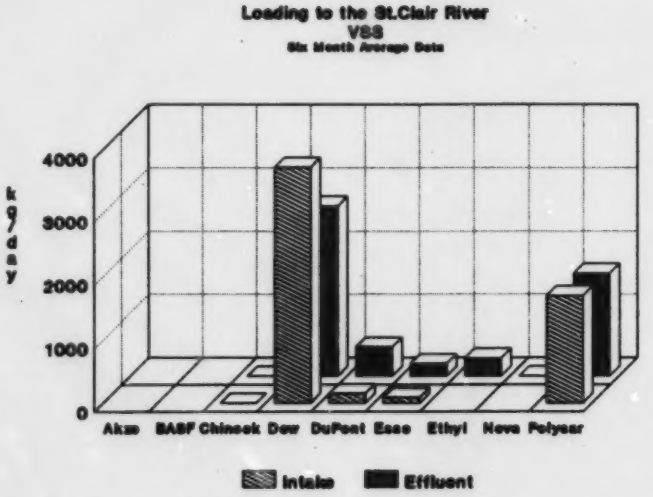
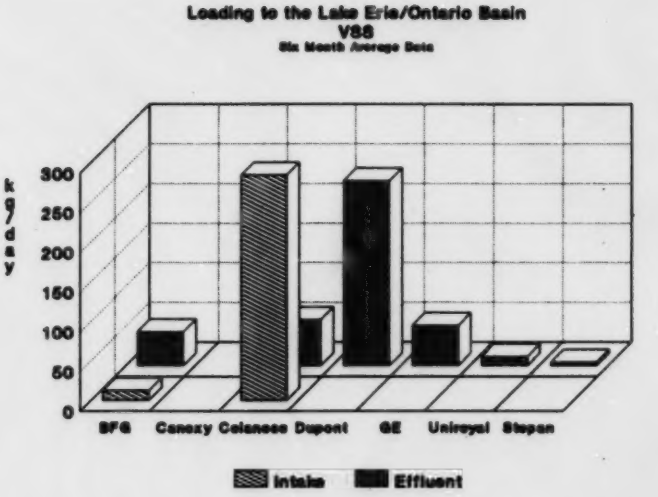


Figure B-6 TSS

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





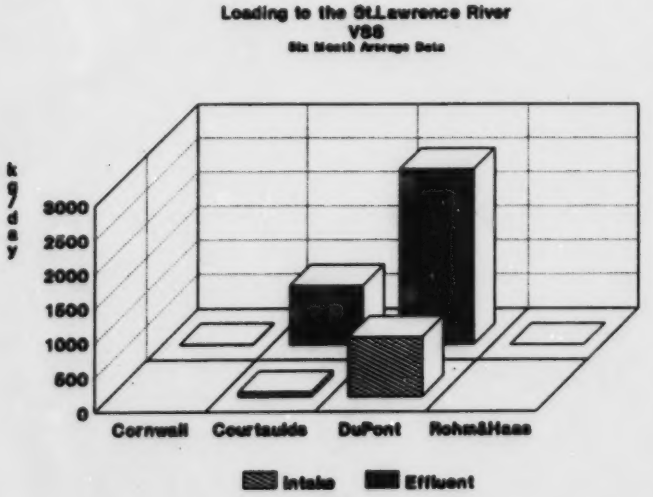
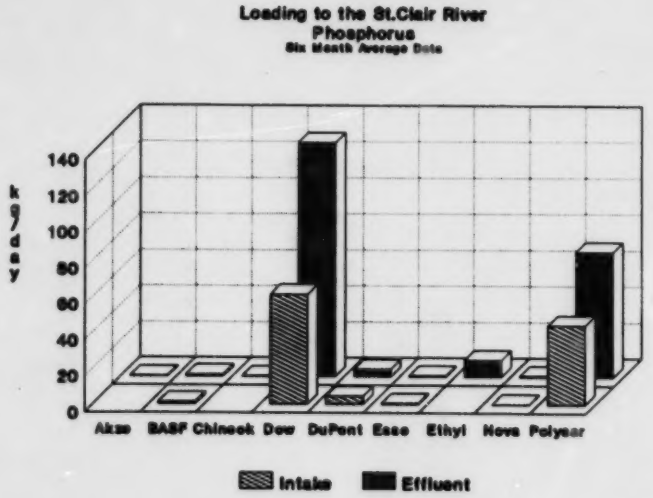
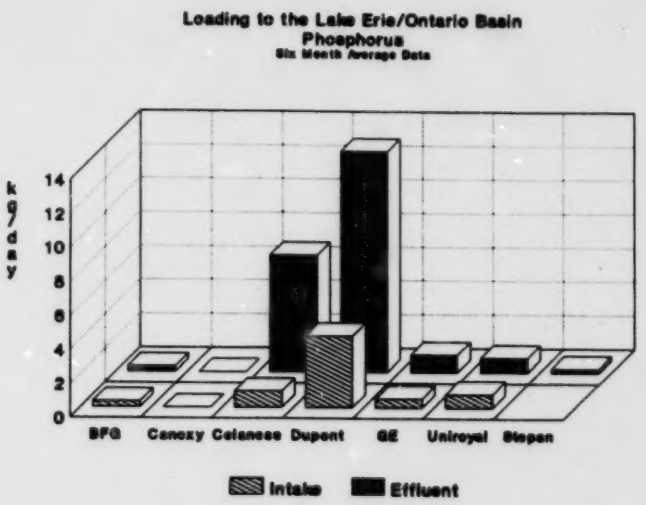


Figure B-7 VSS

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





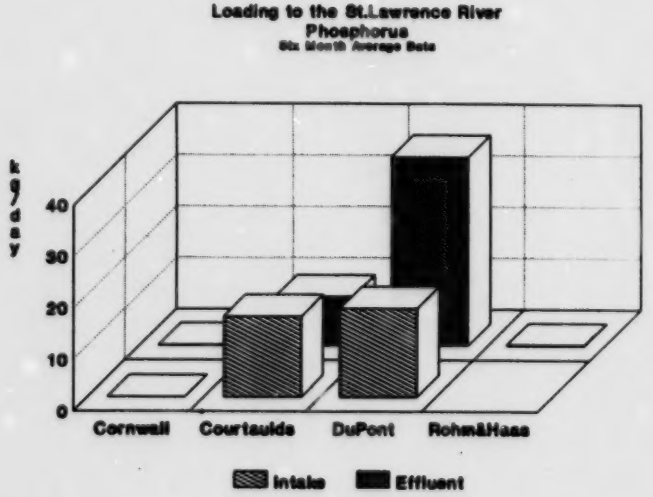
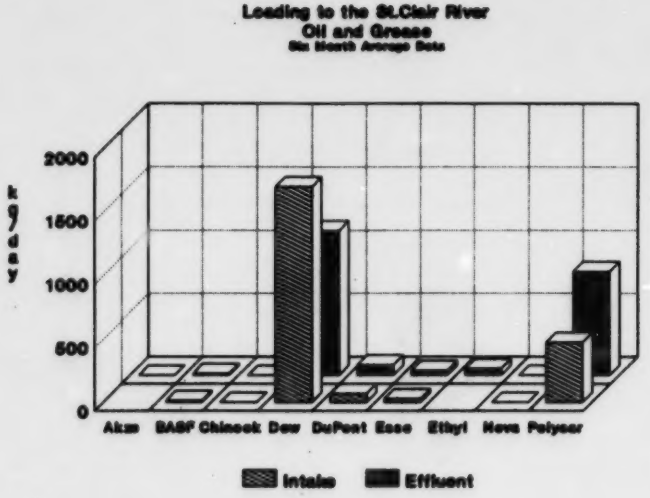
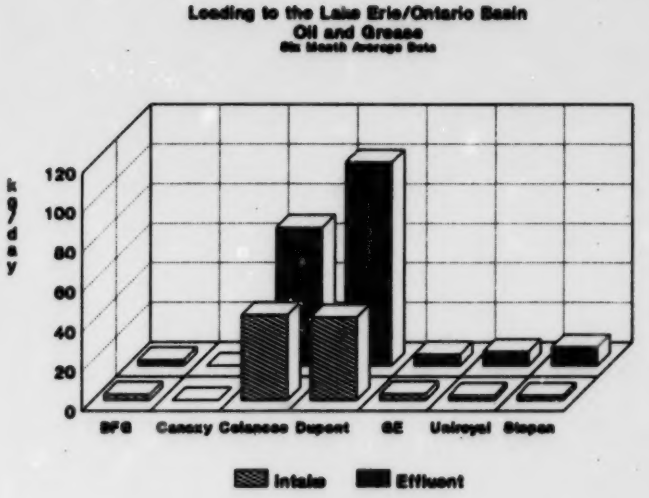


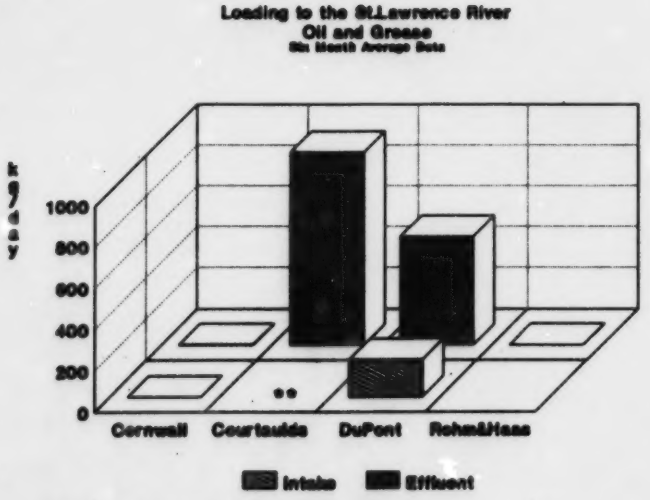
Figure B-8 Phosphorus

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





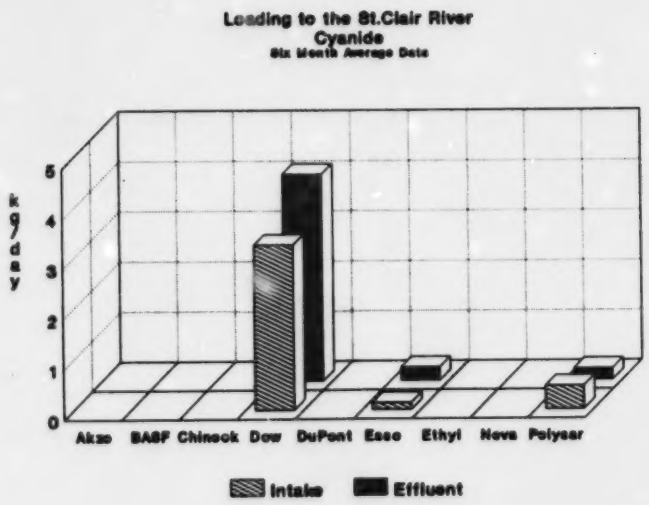


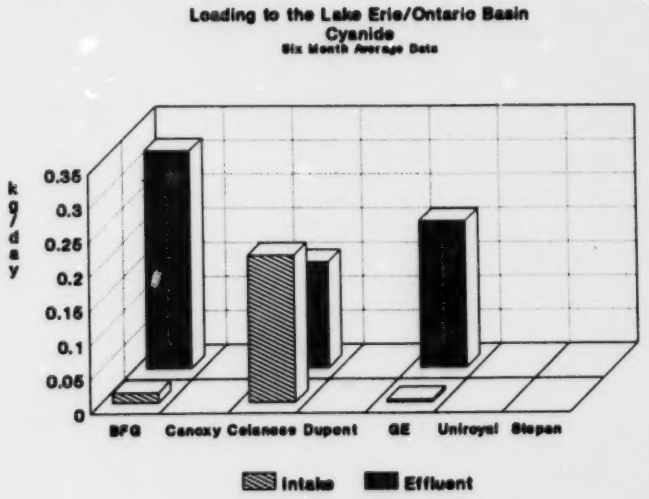
•• Result not plotted due to suspect data

Figure B-9 Oil and Grease

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data





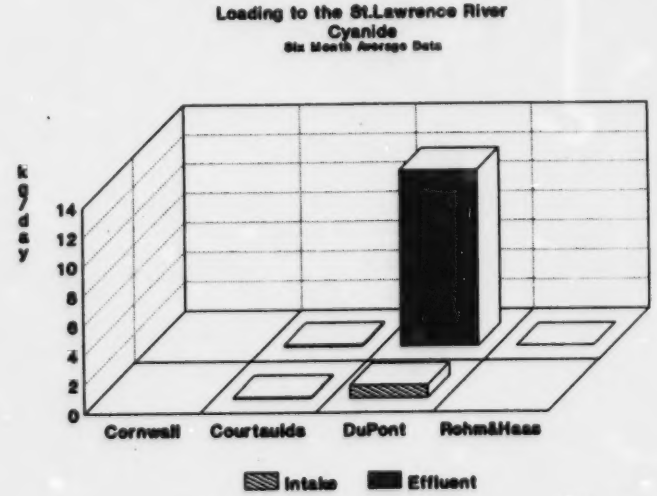
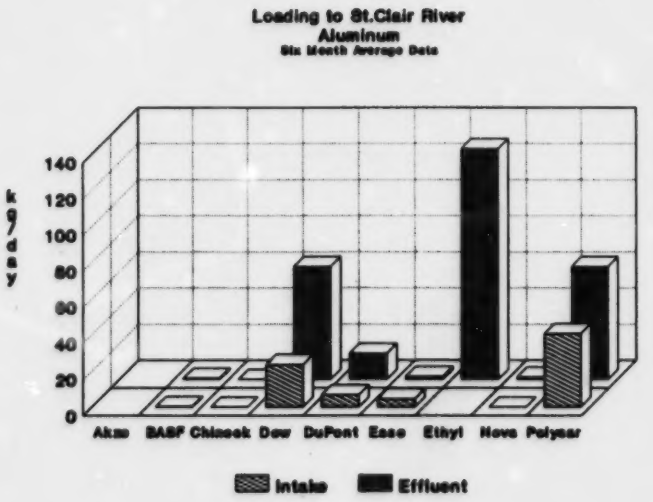
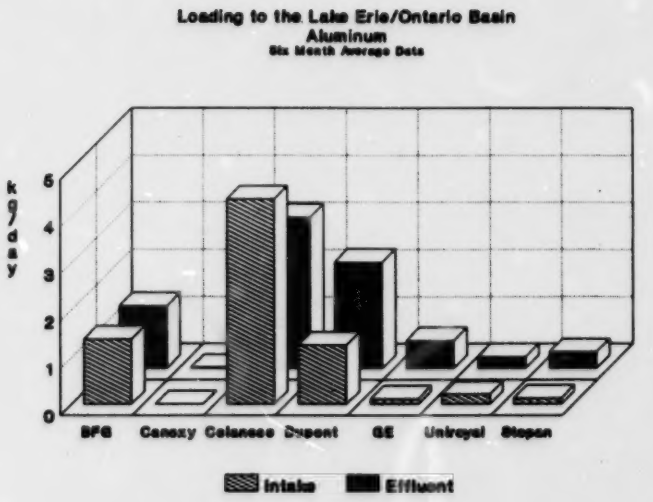


Figure B-10 Cyanide

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data or parameter not found





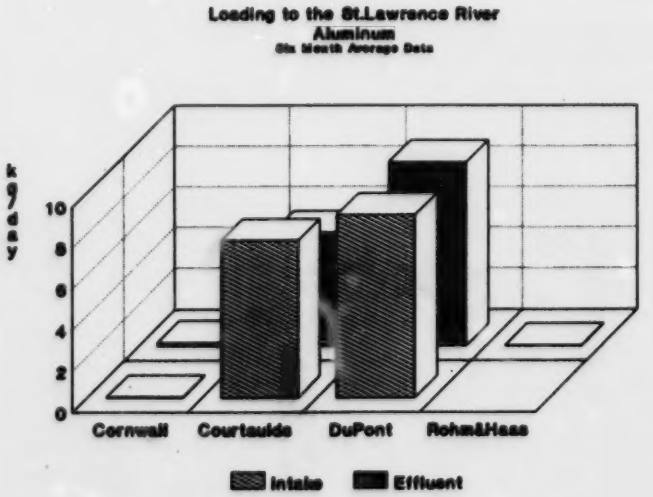
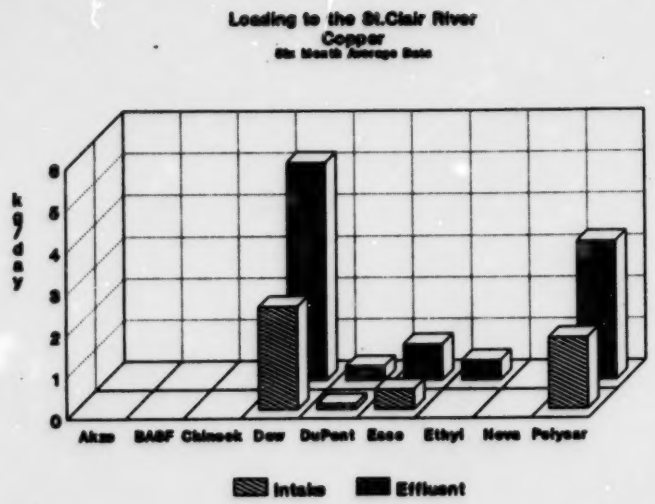
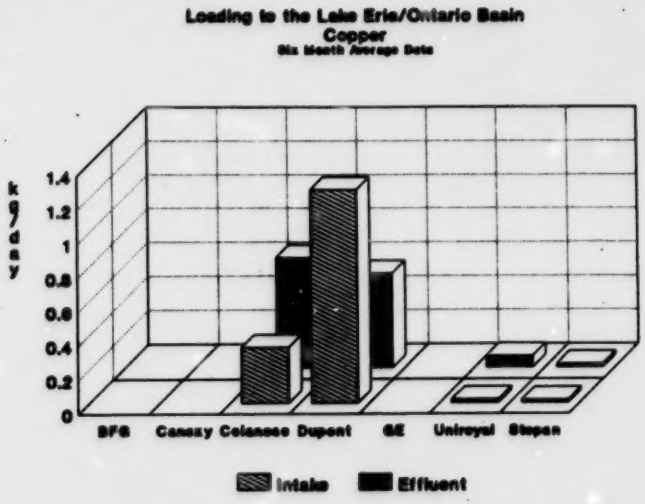


Figure B-11 Aluminum

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data or parameter not found





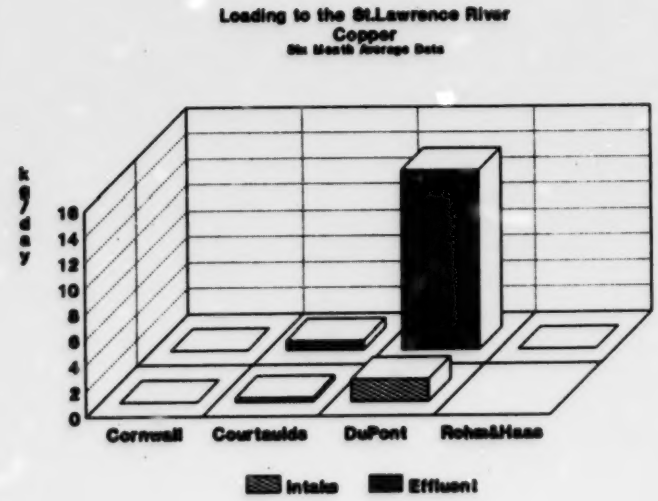
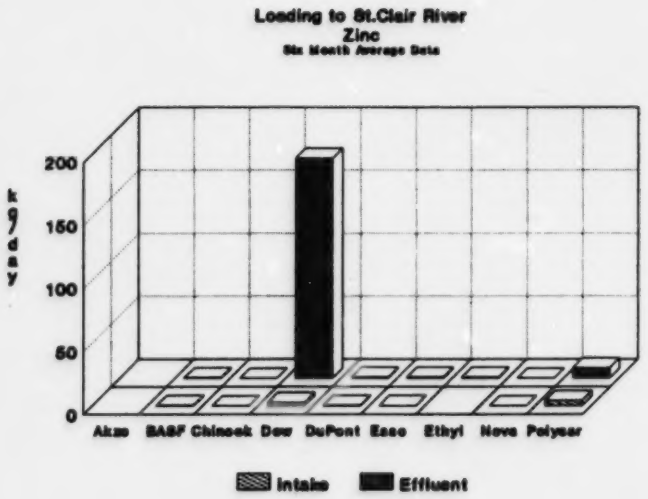
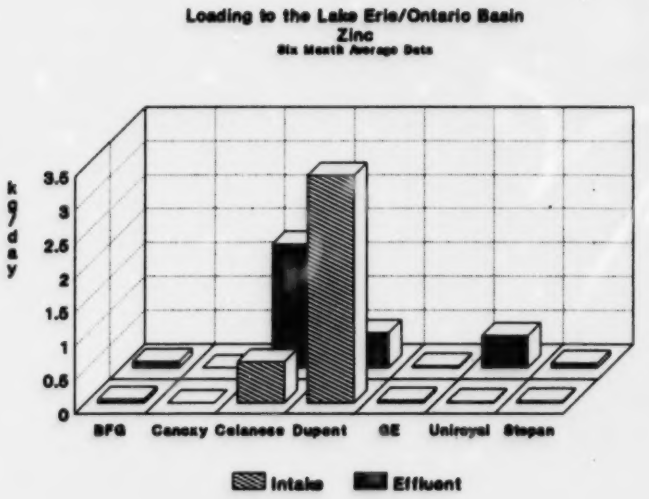


Figure B-12 Copper

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data or parameter not found





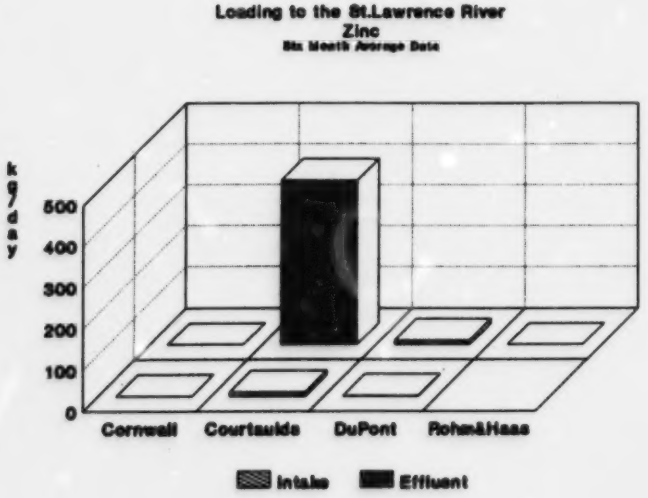
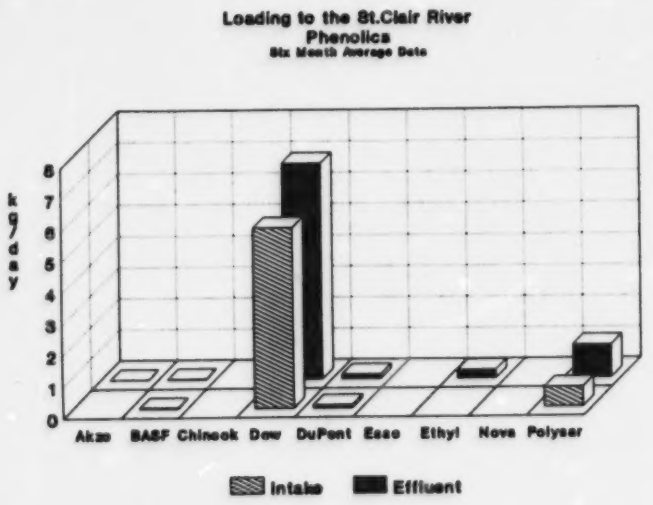
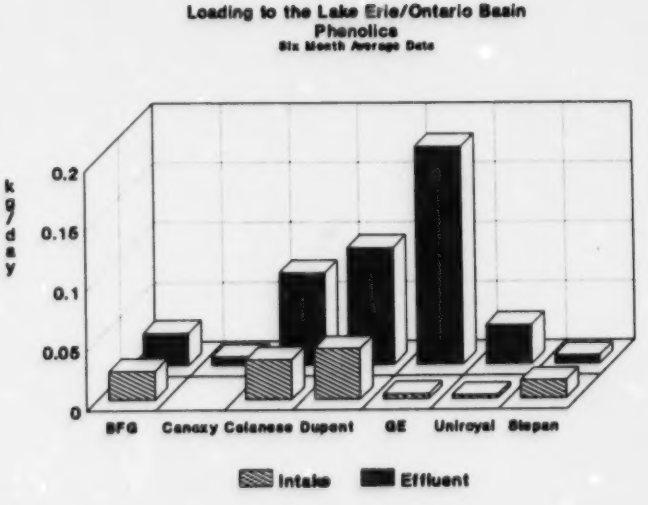


Figure B-13 Zinc

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data or parameter not found





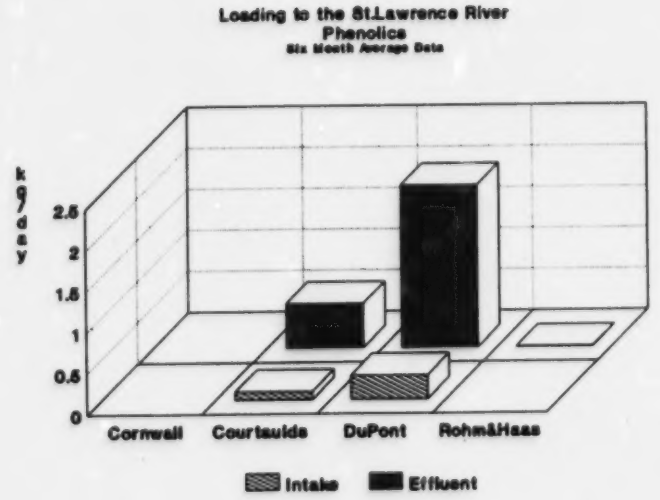


Figure B-14 Phenolics

Note 1: Scales Vary With Each Plot

Note 2: Blank means no data
or parameter not found

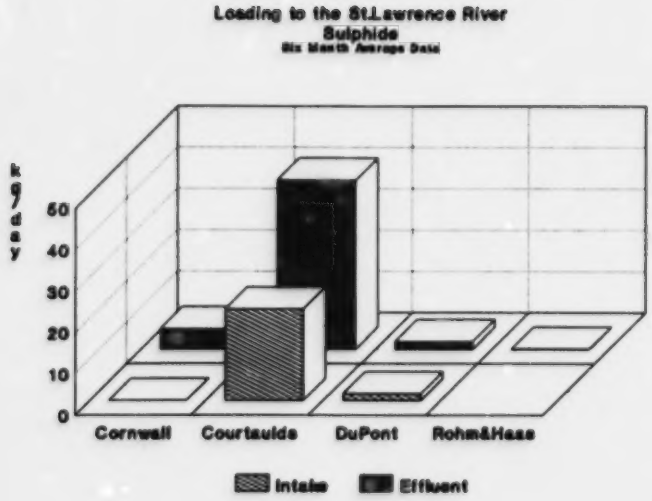


Figure B-15 Sulphide

Note 1: Blank means no data

Note 2:

No significant Sources of Sulphide Were Identified for the St. Clair River Basin and the Lake Erie/Ontario Basin.

APPENDIX C

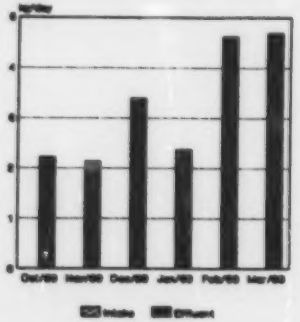
PLOTS OF MONTHLY AVERAGE SITE LOADINGS

		PAGE
Figure C-1	DOC	C-2
Figure C-2	TSS	C-6
Figure C-3	OIL AND GREASE	C-10

FIGURE C-1
MONTHLY AVERAGE SITE LOADINGS - DOC
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

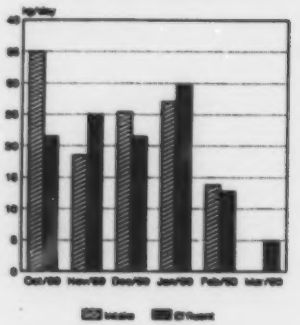
TO THE ST. CLAIR RIVER

DOC
FOR AKZO CHEMICALS LTD.

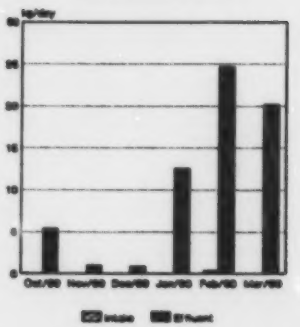


No intake data

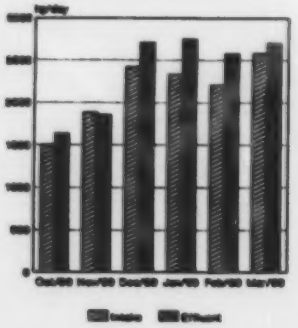
DOC
FOR BASF CANADA INC.



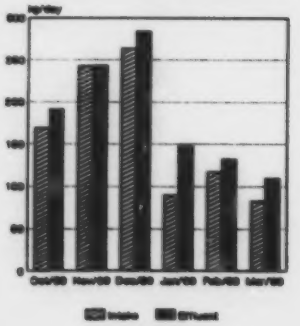
DOC
FOR CHINOOK GROUP



DOC
FOR DOW CHEMICAL



DOC
FOR DU PONT (CORUNNA)



DOC
FOR ESSO CHEMICAL

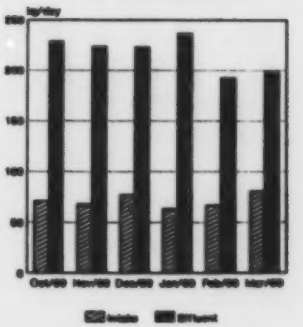
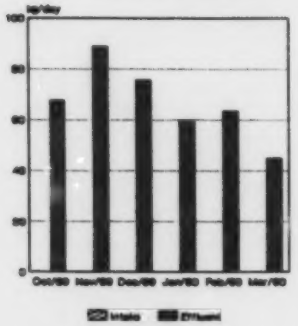


FIGURE C-1 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - DOC
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

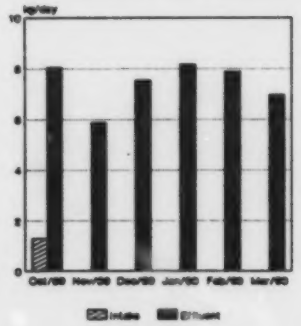
TO THE ST. CLAIR RIVER

DOC
FOR ETHYL CANADA

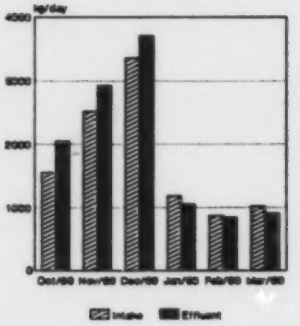


No intake data

DOC
FOR NOVACOR (MOORETOWN)

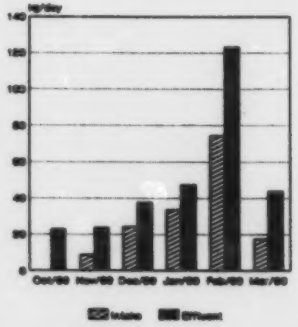


DOC
FOR POLYSAR LTD.

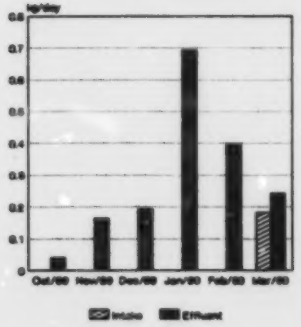


TO THE LAKE ERIE/ONTARIO BASIN

DOC
FOR B.F. GOODRICH



DOC
FOR CANADIANOXY



DOC
FOR CELANESE

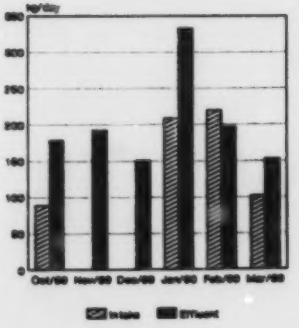
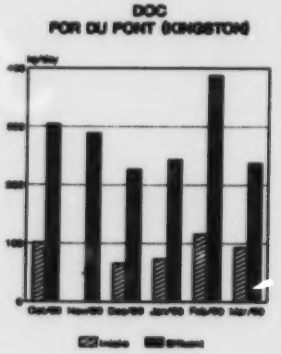
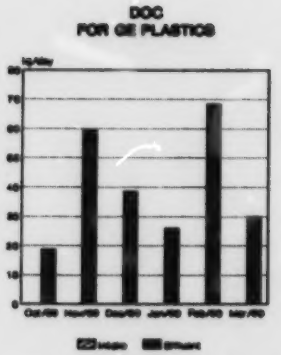


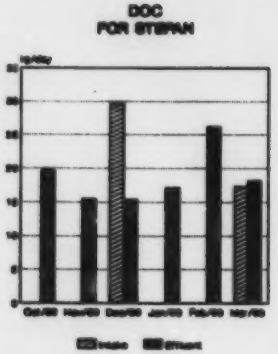
FIGURE C-1 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - DOC
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

TO THE LAKE ERIE/ONTARIO BASIN





No DOC intake data



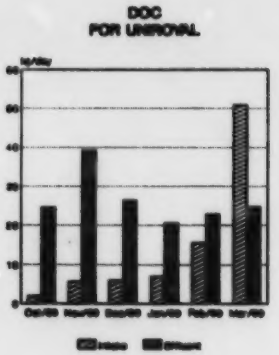
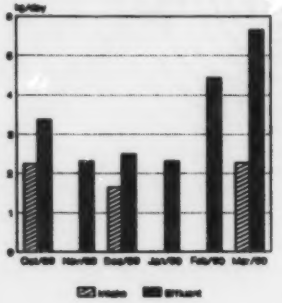


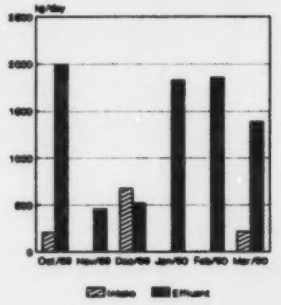
FIGURE C-1 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - DOC
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

TO THE ST. LAWRENCE RIVER

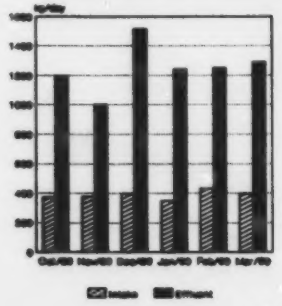
DOC
FOR CORNWALL CHEMICALS



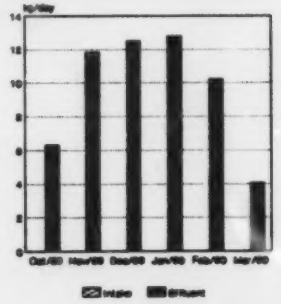
DOC
FOR COURTAULDS FIBRES



DOC
FOR DU PONT (MAITLAND)



DOC
FOR ROHM AND HAAS (M)

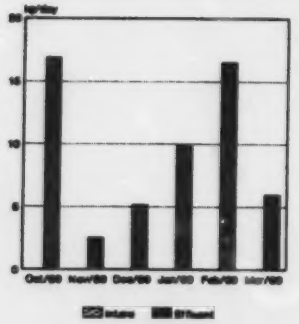


No DOC intake data

FIGURE C-2
MONTHLY AVERAGE SITE LOADINGS - TSS
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

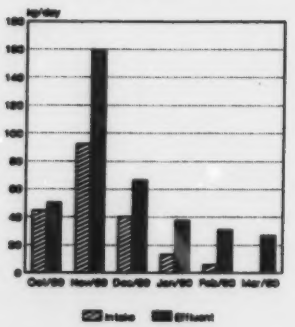
TO THE ST. CLAIR RIVER

TSS
FOR AKZO CHEMICALS LTD.

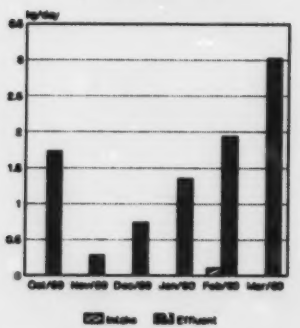


No intake data

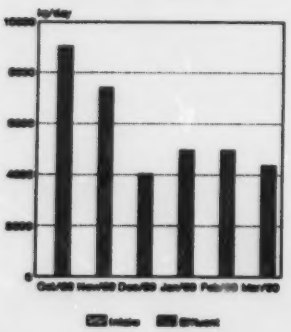
TSS
FOR BASF CANADA INC.



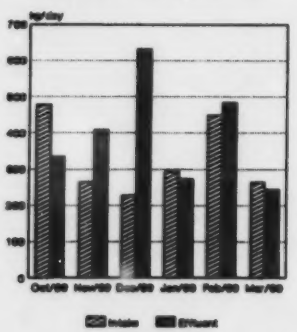
TSS
FOR CHINOOK GROUP



TSS
FOR DOW CHEMICAL



TSS
FOR DU PONT (CORUNNA)



TSS
FOR ESSO CHEMICAL

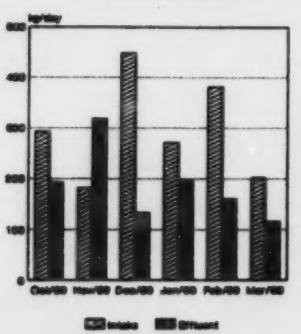
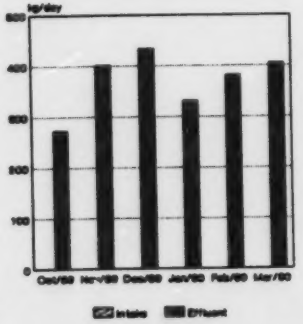


FIGURE C-2 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - TSS
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

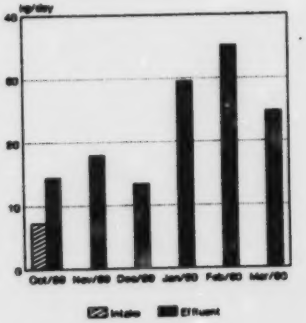
TO THE ST. CLAIR RIVER

TSS
FOR ETHYL CANADA

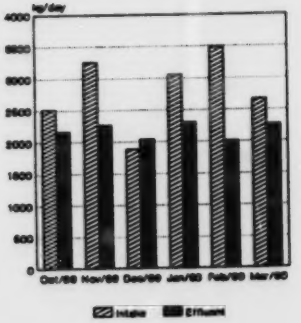


No intake data

TSS
FOR NOVACOR (MOORETOWN)

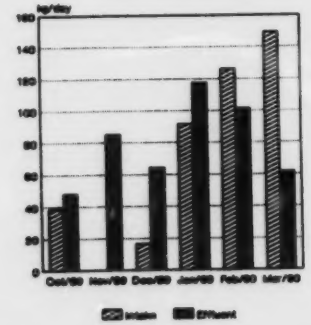


TSS
FOR POLYSAR LTD.

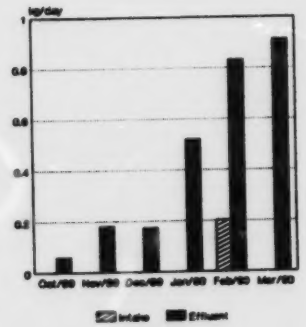


TO THE LAKE ERIE/ONTARIO BASIN

TSS
FOR B.F. GOODRICH



TSS
FOR CANADIANOXY



TSS
FOR CELANESE

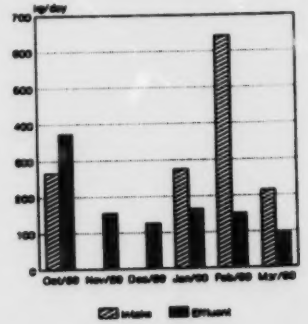
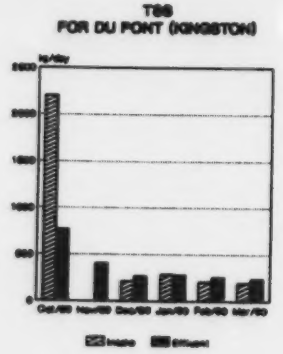
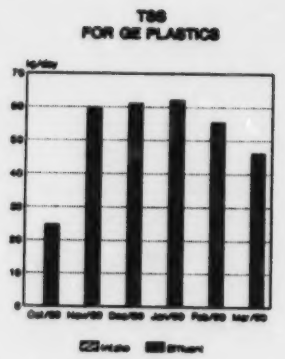


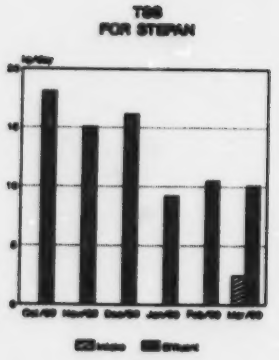
FIGURE C-2 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - TSS
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

TO THE LAKE ERIE/ONTARIO BASIN





No TSS intake data



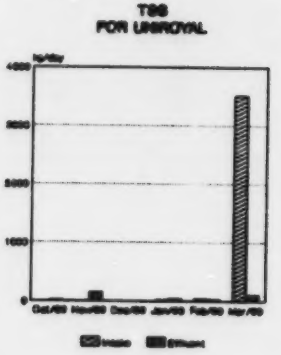
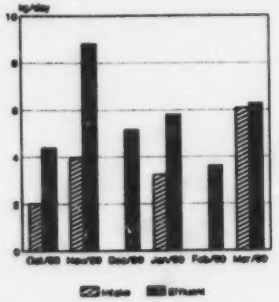


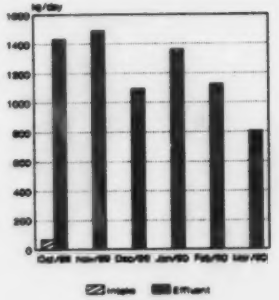
FIGURE C-2 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - TSS
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

TO THE ST. LAWRENCE RIVER

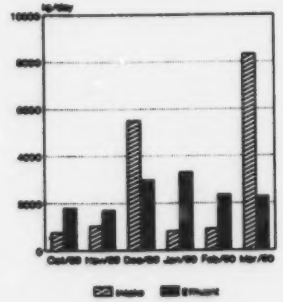
TSS
FOR CORNWALL CHEMICALS



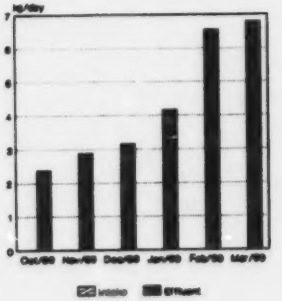
TSS
FOR COURTAULDS FIBRES



TSS
FOR DU PONT (MAITLAND)



TSS
FOR ROHM AND HAAS (M

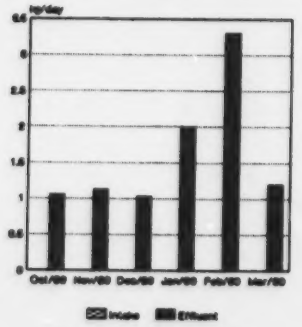


No TSS intake data

FIGURE C-3
MONTHLY AVERAGE SITE LOADINGS - OIL AND GREASE
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

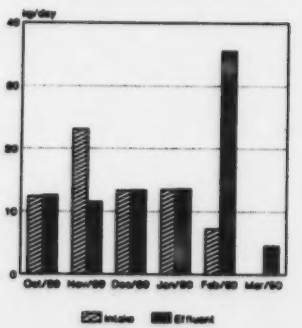
TO THE ST. CLAIR RIVER

OIL AND GREASE
FOR AKZO CHEMICALS LTD.

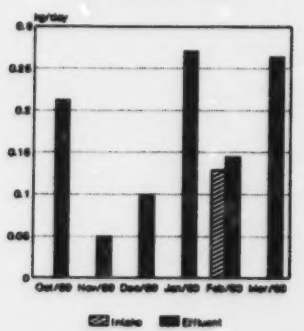


No intake data

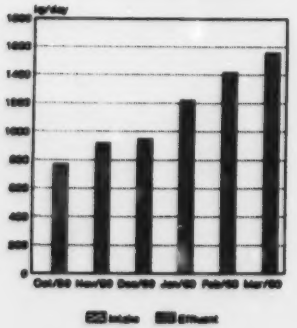
OIL AND GREASE
FOR BASF CANADA INC.



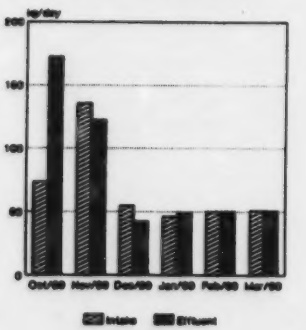
OIL AND GREASE
FOR CHINOOK GROUP



OIL AND GREASE
FOR DOW CHEMICAL



OIL AND GREASE
FOR DU PONT (CORUNNA)



OIL AND GREASE
FOR ESSO CHEMICAL

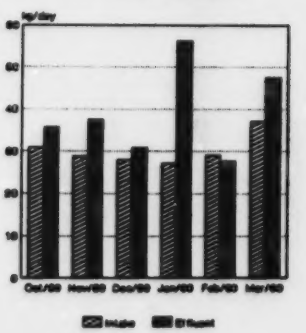
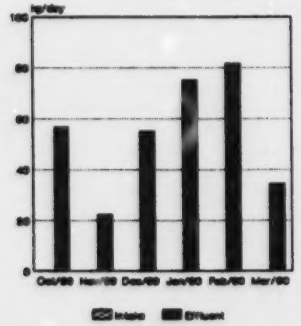


FIGURE C-3 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - OIL AND GREASE
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

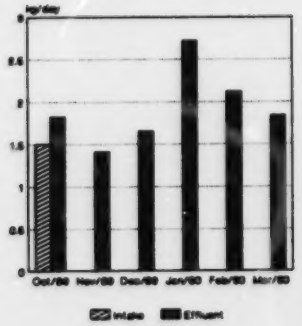
TO THE ST. CLAIR RIVER

OIL AND GREASE
FOR ETHYL CANADA

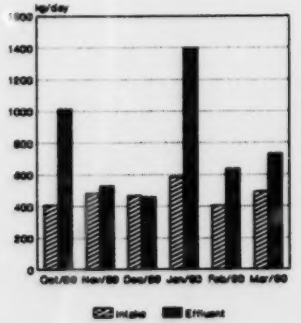


No intake data

OIL AND GREASE
FOR NOVACOR (MOORETOWN)

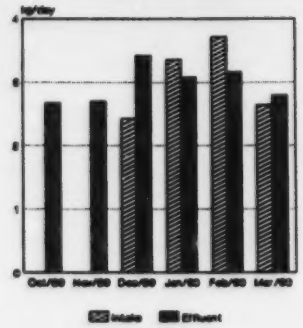


OIL AND GREASE
FOR POLYSAR LTD.

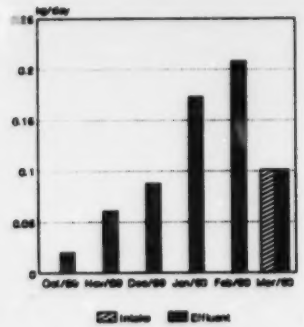


TO THE LAKE ERIE/ONTARIO BASIN

OIL AND GREASE
FOR B.F. GOODRICH



OIL AND GREASE
FOR CANADIANOXY



OIL AND GREASE
FOR CELANESE

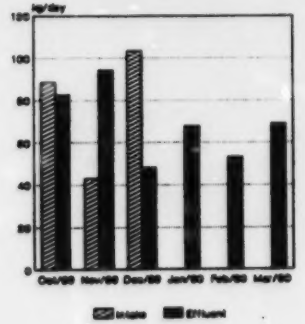
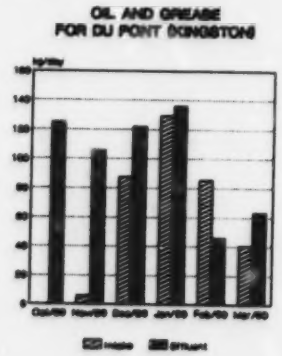
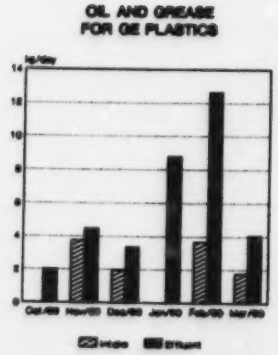
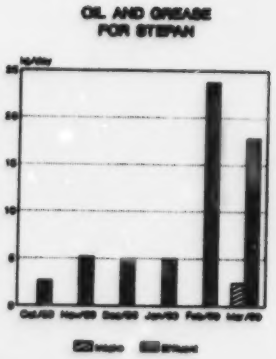


FIGURE C-3 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - OIL AND GREASE
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

TO THE LAKE ERIE/ONTARIO BASIN







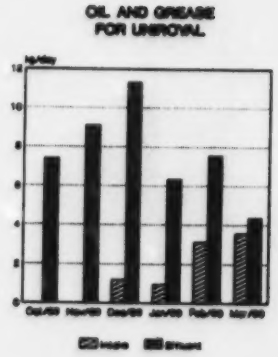
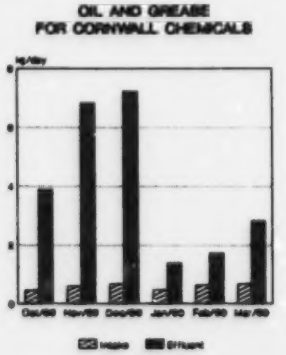
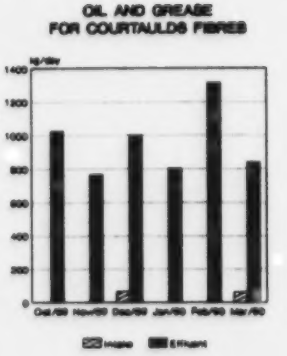
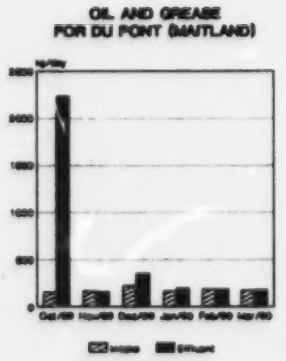


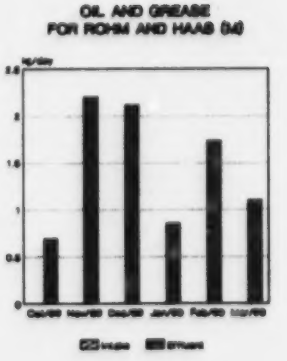
FIGURE C-3 (cont'd)
MONTHLY AVERAGE SITE LOADINGS - OIL AND GREASE
OCM SECTOR
OCTOBER 1, 1989 - MARCH 31, 1990
(Note: Scales vary with each plot)

TO THE ST. LAWRENCE RIVER









No oil and grease intake data

APPENDIX D

SIX-MONTH AVERAGE CONCENTRATION/LOADING TABLES BY INDIVIDUAL CONTROL POINTS FOR EACH PLANT

THE ST. CLAIR RIVER PLANTS

	PAGE
AKZO CHEMICALS LTD. - SARNIA	D-2
BASF CANADA INC. - SARNIA	D-4
CHINOOK GROUP LTD. - SOMBRA	D-6
DOW CHEMICAL CANADA INC. - SARNIA	D-8
DUPONT CANADA INC. - CORUNNA	D-20
ESSO CHEMICAL CANADA - SARNIA	D-22
ETHYL CANADA INC. - CORUNNA	D-24
NOVACOR CHEMICALS LTD. - MOORETOWN	D-26
POLYSAR LTD. - SARNIA	D-28

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – AKZO CHEMICALS LTD. – SARNIA

	PARAMETER	UNIT	IN 0600	OT 0100
o	DOC	mg/L	–	2.3
o	TOC	mg/L	–	2.8
o	COD	mg/L	–	–
o	Ammonia plus Ammonium	mg/L	–	0.10
o	Nitrate+Nitrite	mg/L	–	0.29
o	Total Kjeldahl nitrogen	mg/L	–	0.2
o	Total suspended solids	mg/L	–	6
o	VSS	mg/L	–	–
o	Total phosphorus	mg/L	–	0.1
o	Hydrogen ion (pH)		–	6.9
o	Specific conductance	uS/cm	–	659
o	Oil and grease	mg/L	–	1.0
	Phenolics (4AAP)	ug/L	–	2.6
	Ftflow	m3/day	–	1614

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0600 – Intake Water to Site
OT 0100 – Reactor #4 Cooling Water to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – AKZO CHEMICALS LTD. – SARNIA

	PARAMETER	IN 0600	OT 0100	TOTAL
o	DOC	–	3.235	3.235
o	TOC	–	4.658	4.658
o	COD	–	–	–
o	Ammonia plus Ammonium	–	0.156	0.156
o	Nitrate+Nitrite	–	0.475	0.475
o	Total Kjeldahl nitrogen	–	0.284	0.284
o	Total suspended solids	–	9.488	9.488
o	VSS	–	–	–
o	Total phosphorus	–	0.161	0.161
o	Oil and grease	–	1.614	1.614
	Phenolics (4AAP)	–	0.004	0.004

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'o' – conventional parameter

SAMPLING POINTS:
IN 0600 – Intake Water to Site
OT 0100 – Reactor #4 Cooling Water to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – BASF CANADA INC. – SARNIA

	PARAMETER	UNIT	IN 0500	OT 0100	OT 0200
o	DOC	mg/L	2.0	1.7	1.7
o	TOC	mg/L	2	7	3
o	COD	mg/L	–	–	–
o	Ammonia plus Ammonium	mg/L	0.20	0.20	0.20
o	Nitrate+Nitrite	mg/L	–	–	–
o	Total Kjeldahl nitrogen	mg/L	0.3	0.3	0.5
o	Total suspended solids	mg/L	3	6	14
o	VSS	mg/L	–	–	–
o	Total phosphorus	mg/L	0.1	0.1	0.1
o	Hydrogen ion (pH)		7.7	7.7	7.6
o	Specific conductance	uS/cm	183	197	178
o	Oil and grease	mg/L	1.2	1.3	12.2
	Aluminum	ug/L	30.0	45.0	31.7
	Zinc	ug/L	20.0	20.0	25.0
	Phenolics (4AAP)	ug/L	3.0	2.7	5.7
	Ethylbenzene	ug/L	0.2	4.7	0.2
	Styrene	ug/L	0.3	83.9	0.5
	Acrylonitrile	ug/L	0.8	2974.0	2.7
	Ftflow	m3/day	11623	10376	125

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0500 – Intake Water to Site
OT 0100 – #2 Plant Storm Sewer to River
OT 0200 – #1 Plant Storm Sewer to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

AVERAGE LOADING VALUES (kg/day)

PLANT SITE – BASF CANADA INC. – SARNIA

	PARAMETER	IN 0500	OT 0100	OT 0200	TOTAL
o	DOC	23.905	19.004	0.214	19.218
o	TOC	26.224	83.875	0.422	84.297
o	COD	–	–	–	–
o	Ammonia plus Ammonium	2.325	2.075	0.025	2.100
o	Nitrate+Nitrite	–	–	–	–
o	Total Kjeldahl nitrogen	3.194	3.226	0.058	3.284
o	Total suspended solids	39.292	59.324	2.794	62.118
o	VSS	–	–	–	–
o	Total phosphorus	1.162	1.038	0.013	1.051
o	Oil and grease	13.928	12.440	2.781	15.221
	Aluminum	0.375	0.511	0.004	0.515
	Zinc	0.243	0.227	0.003	0.230
	Phenolics (4AAP)	0.034	0.029	0.001	0.030
	Ethylbenzene	0.002	0.029	*	0.029
	Styrene	0.004	0.579	*	0.579
	Acrylonitrile	0.009	21.442	0.001	21.443

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0500 – Intake Water to Site
OT 0100 – #2 Plant Storm Sewer to River
OT 0200 – #1 Plant Storm Sewer to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – CHINOOK GROUP LTD. – SOMBRA

	PARAMETER	UNIT	IN 0400	CO 0100
o	DOC	mg/L	2.7	74.2
o	TOC	mg/L	–	122
o	COD	mg/L	8	814
o	Ammonia plus Ammonium	mg/L	0.05	1.92
o	Nitrate+Nitrite	mg/L	0.72	1.00
o	Total Kjeldahl nitrogen	mg/L	0.6	16.2
o	Total suspended solids	mg/L	1	14
o	VSS	mg/L	1	17
o	Total phosphorus	mg/L	0.1	2.2
o	Hydrogen ion (pH)		8.3	8.1
o	Specific conductance	uS/cm	257	730
o	Oil and grease	mg/L	0.9	1.9
	Aluminum	ug/L	452.0	348.6
	Chromium	ug/L	2.0	147.7
	Zinc	ug/L	37.0	244.4
	Chromium (hexavalent)	ug/L	–	21.2
	Ftflow	m3/day	–	124

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0400 – Intake Water to Site
CO 0100 – Sump Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – CHINOOK GROUP LTD. – SOMBRA

	PARAMETER	IN 0400	CO 0100	TOTAL
o	DOC	0.334	10.669	10.669
o	TOC	–	16.402	16.402
o	COD	0.990	142.206	142.206
o	Ammonia plus Ammonium	0.006	0.192	0.192
o	Nitrate+Nitrite	0.089	0.108	0.108
o	Total Kjeldahl nitrogen	0.069	2.214	2.214
o	Total suspended solids	0.088	1.513	1.513
o	VSS	0.124	2.970	2.970
o	Total phosphorus	0.007	0.164	0.164
o	Oil and grease	0.110	0.179	0.179
	Aluminum	0.056	0.049	0.049
	Chromium	*	0.009	0.009
	Zinc	0.005	0.015	0.015
	Chromium (hexavalent)	–	0.001	0.001

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0400 – Intake Water to Site
CO 0100 – Sump Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	UNIT	IN 0100	PR 1200	PR 1600	PR 1700	PR 1900	PR 2000	PR 2100	CO 0200	CO 0500
o	DOC	mg/L	2.4	2.8	6.4	8.3	5.7	4.3	40.2	2.4	2.6
o	TOC	mg/L	2	3	6	8	7	4	42	2	2
o	COD	mg/L	6	90	56	62	1195	93	170	6	6
o	Ammonia plus Ammonium	mg/L	0.03	0.03	0.03	0.04	5.70	0.06	5.20	0.03	0.16
o	Nitrate+Nitrite	mg/L	0.79	6.25	0.12	0.28	0.03	1.95	0.03	0.26	0.38
o	Total Kjeldahl nitrogen	mg/L	0.5	0.9	0.7	1.0	1.9	1.4	3.5	0.9	1.8
o	Total suspended solids	mg/L	5	12	84	22	47	13	5	7	7
o	VSS	mg/L	5	5	30	13	17	3	4	3	3
o	Total phosphorus	mg/L	0.1	0.1	16.2	0.2	0.4	0.1	0.3	0.1	0.1
o	Hydrogen ion (pH)		8.0	7.6	11.1	7.7	7.6	7.7	7.6	8.0	8.1
o	Specific conductance	uS/cm	203	14012	7055	10275	87915	4590	4877	203	1103
o	Oil and grease	mg/L	2.1	1.2	2.3	1.4	4.0	1.5	68.4	1.5	1.4
	Cyanide Total	mg/L	0.004	0.007	0.005	0.005	0.005	0.005	0.011	0.005	0.005
	Aluminum	ug/L	28.5	45.0	242.2	53.8	707.5	82.0	83.4	58.0	147.5
	Boron	ug/L	9.0	5.7	32.0	9.3	5.7	25.3	3801.4	9.5	9.5
	Chromium	ug/L	4.5	5.5	64.3	9.5	5.7	4.3	16.8	3.0	3.5
	Copper	ug/L	3.0	8.2	119.2	17.8	10.3	6.2	7.0	3.0	4.0
	Lead	ug/L	24.0	34.0	130.5	110.0	34.0	255.0	24.0	24.0	24.0
	Molybdenum	ug/L	6.0	9.3	9.3	9.3	25.5	19.5	29.4	6.0	7.5
	Nickel	ug/L	6.0	16.0	94.3	214.0	64.7	9.2	9.0	6.0	6.0
	Vanadium	ug/L	16.5	4.0	8.7	4.2	10.2	47.0	28.8	16.0	12.0
	Zinc	ug/L	3.0	21.5	206.8	40.0	6.3	3.8	5.5	3.0	3.5
	Arsenic	ug/L	0.6	0.6	0.6	0.6	0.6	0.6	5.8	0.6	0.6
	Mercury	ug/L	0.07	0.09	0.17	0.09	0.09	0.09	0.12	0.09	0.15
	Phenolics (4AAP)	ug/L	7.0	6.2	2.5	6.4	47.6	31.7	7.0	7.8	6.4
	Sulphide	ug/L	55.0	90.0	920.0	50.0	165.0	45.0	95.0	50.0	65.0
	1,1,2,2–Tetrachloroethane	ug/L	0.7	0.8	0.6	25.2	0.7	0.7	0.7	0.8	0.8
	1,1,2–Trichloroethane	ug/L	0.2	0.3	0.2	175.0	0.2	0.2	21.6	0.7	0.3
	1,1–Dichloroethane	ug/L	0.2	0.3	0.3	366.7	0.2	0.2	46.3	1.3	0.3
	1,1–Dichloroethylene	ug/L	0.4	0.4	7.2	34.3	1.4	0.3	0.4	0.5	0.5
	1,2–Dichloroethane	ug/L	0.4	0.5	1.6	1353.9	3.4	0.6	0.6	10.5	0.6
	1,2–Dichloropropane	ug/L	0.2	0.2	0.2	27.6	5.3	0.2	12.5	7.5	4.7

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PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	UNIT	IN 0100	PR 1200	PR 1600	PR 1700	PR 1900	PR 2000	PR 2100	CO 0200	CO 0500
	Bromodichloromethane	ug/L	0.3	1.2	0.5	0.1	0.3	0.3	0.4	0.3	0.3
	Bromoform	ug/L	0.5	4.1	0.4	11.2	0.4	0.4	0.5	0.5	0.6
	Carbon tetrachloride	ug/L	1.0	1.2	148.3	22.2	1.1	0.6	0.9	26.3	1.3
	Chloroform	ug/L	0.4	2.4	34.8	10.9	0.3	0.2	5.0	1.1	0.6
	Chloromethane	ug/L	20.2	1.2	1.9	1.7	1.4	3.3	1.0	10.9	19.8
	Methylene chloride	ug/L	0.3	0.4	0.3	70.1	0.3	0.3	0.3	0.4	0.4
	Tetrachloroethylene	ug/L	0.7	0.9	339.1	96.7	1.0	1.1	0.9	38.5	4.1
	Trichloroethylene	ug/L	0.4	0.4	0.4	31.3	0.4	0.4	0.4	3.4	0.5
	Vinyl chloride	ug/L	3.7	0.7	0.8	21.4	0.7	1.6	0.7	1.8	1.0
	Benzene	ug/L	0.5	0.3	0.1	0.1	0.6	0.2	0.1	0.3	0.3
	Ethylbenzene	ug/L	0.4	0.5	0.3	0.1	0.8	0.6	0.1	0.4	0.2
	2,6–Dinitrotoluene	ug/L	0.5	0.5	2.0	0.8	1.0	1.3	0.8	2.9	1.6
	2–Chloronaphthalene	ug/L	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	Biphenyl	ug/L	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Bis(2–chloroethyl)ether	ug/L	1.4	1.4	1057.0	1.4	27.8	1.4	1.4	1.4	1.4
	Bis(2–chloroisopropyl)ether	ug/L	1.2	59.1	1.2	4.3	74.6	1.2	2.9	1.2	12.4
	Bis(2–ethylhexyl) phthalate	ug/L	1.1	0.7	16.9	0.6	0.4	2.5	0.6	0.7	1.0
	Di–n–butyl phthalate	ug/L	1.4	1.4	25.2	1.4	1.4	1.5	1.4	1.4	1.4
	N–Nitrosodi–n–propylamine	ug/L	1	1	351	2	9	2	1	1	1
	Naphthalene	ug/L	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	Phenanthrene	ug/L	0.1	0.3	0.1	0.1	0.1	0.3	0.1	0.1	0.1
	2,3,4,5–Tetrachlorophenol	ug/L	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	2,3,4–Trichlorophenol	ug/L	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	1,2,3,4–Tetrachlorobenzene	ng/L	3.4	5.8	1.0	1.5	1.8	4.0	2.8	11.0	5.8
	1,2,3,5–Tetrachlorobenzene	ng/L	2.6	5.5	1.0	1.3	2.0	3.0	2.2	3.2	3.0
	1,2,3–Trichlorobenzene	ng/L	5.8	8.5	1.0	2.0	2.0	7.0	4.6	7.0	7.0
	1,2,4,5–Tetrachlorobenzene	ng/L	5.8	4.5	1.0	2.0	41.8	7.0	4.6	7.0	7.0
	1,2,4–Trichlorobenzene	ng/L	15.2	6.3	1.0	2262.5	2.3	9.0	144.6	179.8	31.8
	2,4,5–Trichlorotoluene	ng/L	7.4	5.0	1.0	720.3	2.3	9.0	7.8	89.8	10.5
	Hexachlorobenzene	ng/L	3.4	31.5	198.0	934.8	1.3	6.0	8.6	33.5	14.5
	Hexachlorobutadiene	ng/L	9.0	3.0	1.0	118.2	1.7	8.5	171.2	105.2	16.0
	Hexachlorocyclopentadiene	ng/L	4.2	3.0	330.2	1.7	1.7	5.0	3.4	5.0	5.0

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PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	UNIT	IN 0100	PR 1200	PR 1600	PR 1700	PR 1900	PR 2000	PR 2100	CO 0200	CO 0500
	Hexachloroethane	ng/L	4.6	3.0	7013.5	201.2	1.7	6.5	10.2	124.2	10.8
	Octachlorostyrene	ng/L	8.6	5.0	1.0	2.3	2.3	9.0	7.4	19.8	11.7
	Pentachlorobenzene	ng/L	4.2	23.5	1.0	1.7	1.7	5.5	3.4	13.2	6.3
	Octachlorodibenzo–p–dioxin	pg/L	22.4	1665.0	22.4	112.0	49.1	22.4	22.4	22.4	166.0
	Octachlorodibenzofuran	pg/L	27.9	21613.0	711.0	214.0	281.0	27.9	27.9	27.9	311.0
	Total H6CDD	pg/L	3.0	430.0	3.0	3.0	3.7	3.0	3.0	3.0	3.0
	Total H6CDF	pg/L	7.1	11538.6	7.1	153.0	67.6	7.1	7.1	7.1	792.0
	Total H7CDD	pg/L	13.2	1101.0	13.2	13.2	13.2	13.2	13.2	13.2	78.9
	Total H7CDF	pg/L	10.7	17742.4	133.0	227.0	113.8	85.3	10.7	10.7	492.0
	Total PCDD	pg/L	9.9	115.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
	Total PCDF	pg/L	5.7	5190.0	5.7	47.9	26.8	5.7	5.7	5.7	467.0
	Total TCDD	pg/L	2.8	95.7	2.8	2.8	3.1	2.8	2.8	2.8	2.8
	Total TCDF	pg/L	3.4	2090.8	2609.0	44.2	215.8	4.1	3.4	3.4	135.0
	PCBT	ug/L	0.05	0.10	0.05	0.03	0.05	0.05	0.05	0.05	0.05
	Ftflow	m3/day	–	752	728	1188	9174	1258	137	63776	28755
	Volume Discharged – Total	m3	**	**	**	**	**	**	**	**	**

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PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	UNIT	CO 0600	CO 0700	CO 0900	OT 0300	OT 1000	WA 2200	WA 2300
o	DOC	mg/L	2.5	2.4	2.6	3.0	2.9	12.6	11.6
o	TOC	mg/L	2	2	2	2	2	12	12
o	COD	mg/L	6	26	9	–	–	–	–
o	Ammonia plus Ammonium	mg/L	0.03	0.04	0.03	–	–	–	–
o	Nitrate+Nitrite	mg/L	0.25	0.29	0.29	–	0.30	–	–
o	Total Kjeldahl nitrogen	mg/L	0.8	0.6	0.7	–	–	–	–
o	Total suspended solids	mg/L	7	6	7	5	18	29	20
o	VSS	mg/L	3	3	3	–	–	8	6
o	Total phosphorus	mg/L	0.1	0.1	0.2	0.1	0.1	0.7	0.5
o	Hydrogen ion (pH)		8.0	8.0	8.0	8.0	8.1	7.6	7.6
o	Specific conductance	uS/cm	216	203	2603	206	214	3215	1590
o	Oil and grease	mg/L	1.2	1.2	1.1	2.4	1.1	1.1	1.8
	Cyanide Total	mg/L	0.005	0.005	0.005	–	–	–	–
	Aluminum	ug/L	55.0	34.0	71.0	–	–	330.8	519.3
	Boron	ug/L	9.0	9.0	9.0	–	–	45.0	60.5
	Chromium	ug/L	6.0	3.0	6.0	–	–	39.4	6.8
	Copper	ug/L	3.0	3.5	7.0	–	–	8.4	8.6
	Lead	ug/L	24.0	24.0	36.0	–	–	24.0	21.9
	Molybdenum	ug/L	6.5	6.0	10.0	–	–	26.1	21.1
	Nickel	ug/L	6.0	6.0	18.0	–	–	6.4	6.6
	Vanadium	ug/L	17.0	16.5	5.0	–	–	57.3	57.1
	Zinc	ug/L	3.0	3.0	274.5	–	–	7.4	17.2
	Arsenic	ug/L	0.6	0.6	0.6	–	–	–	–
	Mercury	ug/L	0.10	0.09	0.09	–	0.09	0.14	0.32
	Phenolics (4AAP)	ug/L	3.8	8.5	8.8	4.7	7.0	27.4	6.6
	Sulphide	ug/L	40.0	50.0	45.0	–	–	–	–
	1,1,2,2–Tetrachloroethane	ug/L	0.9	0.8	0.8	0.8	0.8	–	–
	1,1,2–Trichloroethane	ug/L	2.1	0.3	0.3	0.3	0.3	–	–
	1,1–Dichloroethane	ug/L	0.3	0.3	0.3	0.3	0.3	–	–
	1,1–Dichloroethylene	ug/L	0.5	0.5	0.5	0.5	0.5	–	–
	1,2–Dichloroethane	ug/L	13.4	0.5	1.4	0.5	11.3	–	–
	1,2–Dichloropropane	ug/L	6.8	0.3	0.3	0.3	0.3	–	–

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	PARAMETER	UNIT	CO 0600	CO 0700	CO 0900	OT 0300	OT 1000	WA 2200	WA 2300
	Bromodichloromethane	ug/L	0.3	0.3	0.3	0.3	0.3	–	–
	Bromoform	ug/L	0.6	0.5	0.5	0.6	0.5	–	–
	Carbon tetrachloride	ug/L	1.7	1.5	1.3	1.3	1.3	–	–
	Chloroform	ug/L	0.7	0.5	0.5	0.6	0.6	–	–
	Chloromethane	ug/L	18.3	14.4	10.6	21.5	6.1	–	–
	Methylene chloride	ug/L	4.2	0.4	0.4	0.4	0.4	–	–
	Tetrachloroethylene	ug/L	1.4	0.8	0.8	1.1	3.0	–	–
	Trichloroethylene	ug/L	0.7	0.5	0.5	0.5	0.5	–	–
	Vinyl chloride	ug/L	0.9	2.4	2.0	0.9	1.5	–	–
	Benzene	ug/L	0.6	0.3	0.3	–	0.2	–	–
	Ethylbenzene	ug/L	0.3	0.6	0.9	–	–	–	–
	2,6–Dinitrotoluene	ug/L	0.9	3.5	1.9	–	–	–	–
	2–Chloronaphthalene	ug/L	2.8	2.8	2.8	–	–	–	–
	Biphenyl	ug/L	1.0	1.0	1.0	–	–	–	–
	Bis(2–chloroethyl)ether	ug/L	1.4	1.4	1.4	–	–	–	–
	Bis(2–chloroisopropyl)ether	ug/L	3.1	1.2	5.0	–	–	–	–
	Bis(2–ethylhexyl) phthalate	ug/L	1.6	0.9	0.5	–	–	–	–
	Di–n–butyl phthalate	ug/L	3.0	1.4	1.4	–	–	–	–
	N–Nitrosodi–n–propylamine	ug/L	1	1	5	–	–	–	–
	Naphthalene	ug/L	2.2	2.2	2.2	–	–	–	–
	Phenanthrene	ug/L	0.1	0.1	0.1	–	–	–	–
	2,3,4,5–Tetrachlorophenol	ug/L	0.5	0.5	0.5	–	0.4	–	–
	2,3,4–Trichlorophenol	ug/L	0.7	0.7	0.7	–	0.2	–	–
	1,2,3,4–Tetrachlorobenzene	ng/L	4.8	4.2	7.3	4.0	–	–	–
	1,2,3,5–Tetrachlorobenzene	ng/L	3.0	3.0	3.0	3.0	–	–	–
	1,2,3–Trichlorobenzene	ng/L	7.2	7.0	8.0	7.0	–	–	–
	1,2,4,5–Tetrachlorobenzene	ng/L	7.0	7.0	7.0	7.0	–	–	–
	1,2,4–Trichlorobenzene	ng/L	41.2	14.8	13.7	21.2	–	–	–
	2,4,5–Trichlorotoluene	ng/L	11.3	9.0	16.0	9.3	–	–	–
	Hexachlorobenzene	ng/L	4.5	4.0	3.3	12.7	–	–	–
	Hexachlorobutadiene	ng/L	19.0	6.7	7.3	15.0	–	–	–
	Hexachlorocyclopentadiene	ng/L	5.0	5.0	5.0	5.0	–	–	–

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SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	UNIT	CO 0600	CO 0700	CO 0900	OT 0300	OT 1000	WA 2200	WA 2300
	Hexachloroethane	ng/L	8.2	5.3	7.0	8.0	–	–	–
	Octachlorostyrene	ng/L	10.3	13.8	9.7	9.3	–	–	–
	Pentachlorobenzene	ng/L	5.2	5.0	5.0	5.0	–	–	–
	Octachlorodibenzo–p–dioxin	pg/L	22.4	22.4	22.4	–	–	–	–
	Octachlorodibenzofuran	pg/L	27.9	27.9	27.9	–	–	–	–
	Total H6CDD	pg/L	3.0	3.0	3.0	–	–	–	–
	Total H6CDF	pg/L	7.1	7.1	7.1	–	–	–	–
	Total H7CDD	pg/L	13.2	13.2	13.2	–	–	–	–
	Total H7CDF	pg/L	10.7	10.7	10.7	–	–	–	–
	Total PCDD	pg/L	9.9	9.9	9.9	–	–	–	–
	Total PCDF	pg/L	5.7	5.7	5.7	–	–	–	–
	Total TCDD	pg/L	2.8	2.8	2.8	–	–	–	–
	Total TCDF	pg/L	3.4	3.4	3.4	–	–	–	–
	PCBT	ug/L	0.05	0.05	0.05	–	–	–	–
	Ftflow	m3/day	55814	103196	568909	57332	12370	**	**
	Volume Discharged – Total	m3	**	**	**	**	**	5072	1534

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'**' parameter does not pertain to this stream
'o' – conventional parameter

SAMPLING POINTS
IN 0100 – Intake Water to Site
PR 1200 – Throx Stripper Effluent flows into CO 0500
PR 1600 – Block 90 Feed (Building 88) flows into CO 0900
PR 1700 – Block 90 Feed (Buildings 35 & 39) flows into CO 0900
PR 1900 – Biox Plant Effluent flows into CO 0900
PR 2000 – Boiler Feedwater Effluent flows into CO 0900
PR 2100 – Scott Road Treated Runoff to River
CO 0200 – 42 inch Outfall to River
CO 0500 – 54 inch Sluice Outfall to River
CO 0600 – 2nd Street Outfall to River
CO 0700 – 3rd Street Outfall to River
CO 0900 – 4th Street Outfall to River
OT 0300 – 48 inch Outfall to River
OT 1000 – 5th Street Outfall to River
WA 2200 – Lasalle Road Runoff to River
WA 2300 – Lasalle Road Runoff to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	IN 0100	PR 1200	PR 1600	PR 1700	PR 1900	PR 2000	PR 2100	CO 0200	CO 0500	CO 0600
o	DOC	2016.135	2.197	5.849	11.120	58.016	5.277	6.137	156.335	73.656	139.233
o	TOC	1753.519	2.205	6.035	11.062	66.848	5.294	6.578	132.842	65.250	127.541
o	COD	5117.311	54.405	6.262	68.382	4524.170	108.188	–	375.468	178.691	363.745
o	Ammonia plus Ammonium	20.581	0.015	0.005	0.041	78.207	0.065	–	1.510	2.719	1.463
o	Nitrate+Nitrite	651.189	8.220	0.011	0.320	0.297	3.234	–	15.607	10.775	14.580
o	Total Kjeldahl nitrogen	426.443	0.409	0.061	0.435	10.892	1.761	–	61.667	45.931	46.572
o	Total suspended solids	3842.099	12.115	55.303	28.329	523.932	24.160	0.895	383.729	190.613	428.703
o	VSS	3728.491	2.925	3.636	21.222	175.556	5.032	–	181.211	86.241	175.553
o	Total phosphorus	60.920	0.092	4.991	0.263	4.167	0.087	0.043	4.631	1.588	4.816
o	Oil and grease	1702.477	0.838	0.985	1.385	34.518	1.423	10.870	94.529	41.379	67.456
	Cyanide Total	3.293	0.003	0.001	0.006	0.048	0.006	–	0.302	0.144	0.293
	Aluminum	23.463	0.039	0.618	0.083	6.221	0.138	0.013	3.247	5.184	3.199
	Boron	7.409	0.005	0.018	0.014	0.060	0.028	0.636	0.581	0.266	0.527
	Chromium	3.705	0.004	0.029	0.014	0.054	0.004	*	0.181	0.108	0.371
	Copper	2.470	0.005	0.188	0.027	0.099	0.008	*	0.181	0.129	0.176
	Lead	19.758	0.026	0.357	0.186	0.318	0.611	0.004	1.450	0.690	1.404
	Molybdenum	4.939	0.007	0.007	0.011	0.311	0.021	0.003	0.362	0.237	0.385
	Nickel	4.939	0.012	0.084	0.363	0.216	0.008	0.001	0.362	0.172	0.351
	Vanadium	13.584	0.003	0.007	0.005	0.124	0.052	0.004	0.966	0.459	0.985
	Zinc	2.470	0.015	0.694	0.068	0.115	0.005	*	0.181	0.094	0.176
	Arsenic	0.494	*	*	0.001	0.006	0.001	*	0.036	0.017	0.035
	Mercury	0.060	*	*	*	0.001	*	*	0.006	0.005	0.005
	Phenolics (4AAP)	5.785	0.007	0.001	0.008	0.609	0.069	0.001	0.437	0.113	0.237
	Sulphide	45.279	0.059	0.008	0.071	2.493	0.063	–	2.870	1.514	2.341
	1,1,2,2–Tetrachloroethane	0.594	0.001	*	0.020	0.007	0.001	*	0.053	0.024	0.049
	1,1,2–Trichloroethane	0.200	*	*	0.196	0.002	–	0.002	0.043	0.009	0.105
	1,1–Dichloroethane	0.203	*	*	0.374	0.002	*	0.003	0.076	0.009	0.019
	1,1–Dichloroethylene	0.327	*	0.021	0.030	0.019	*	*	0.032	0.014	0.028
	1,2–Dichloroethane	0.368	*	*	1.277	0.024	0.001	*	0.697	0.020	0.692

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	IN 0100	PR 1200	PR 1600	PR 1700	PR 1900	PR 2000	PR 2100	CO 0200	CO 0500	CO 0600
	1,2–Dichloropropane	0.177	*	*	0.044	0.044	*	*	0.474	0.109	0.367
	Bromodichloromethane	0.217	*	*	*	0.003	*	*	0.018	0.008	0.017
	Bromoform	0.395	*	*	0.015	0.004	*	*	0.033	0.017	0.033
	Carbon tetrachloride	0.787	0.001	0.163	0.008	0.013	0.001	*	1.783	0.038	0.094
	Chloroform	0.311	0.001	0.012	0.008	0.003	*	*	0.077	0.017	0.038
	Chloromethane	16.588	0.001	0.001	0.003	0.013	0.006	*	0.631	0.685	1.040
	Methylene chloride	0.278	*	*	0.074	0.003	*	*	0.028	0.012	0.248
	Tetrachloroethylene	0.597	0.001	0.044	0.063	0.010	0.001	*	2.491	0.116	0.078
	Trichloroethylene	0.328	*	*	0.028	0.004	0.001	*	0.227	0.013	0.034
	Vinyl chloride	3.060	0.001	*	0.020	0.007	0.001	*	0.109	0.027	0.051
	Benzene	0.389	*	*	*	0.005	*	–	0.017	0.006	0.035
	Ethylbenzene	0.310	*	*	*	0.006	0.001	–	0.027	0.006	0.018
	2,6–Dinitrotoluene	0.412	*	*	0.001	0.013	0.003	–	0.139	0.030	0.053
	2–Chloronaphthalene	2.305	0.002	0.001	0.003	0.026	0.004	–	0.169	0.080	0.164
	Biphenyl	0.823	0.001	*	0.001	0.009	0.001	–	0.060	0.029	0.059
	Bis(2–chloroethyl)ether	1.153	0.001	0.214	0.002	0.235	0.002	–	0.085	0.040	0.082
	Bis(2–chloroisopropyl)ether	0.988	0.068	–	0.004	0.841	0.002	–	0.072	0.202	0.175
	Bis(2–ethylhexyl) phthalate	0.864	*	0.003	0.001	0.004	*	–	0.034	0.029	0.105
	Di–n–butyl phthalate	1.153	0.001	0.005	0.002	0.013	0.001	–	0.085	0.040	0.188
	N–Nitrosodi–n–propylamine	0.741	0.001	0.071	0.003	0.136	0.003	–	0.066	0.026	0.053
	Naphthalene	1.811	0.002	*	0.003	0.021	0.003	–	0.133	0.063	0.129
	Phenanthrene	0.082	*	*	*	0.001	*	–	0.006	0.003	0.006
	2,3,4,5–Tetrachlorophenol	0.317	*	*	0.001	0.005	0.001	*	0.030	0.014	0.029
	2,3,4–Trichlorophenol	0.445	0.001	*	0.001	0.007	0.001	*	0.042	0.020	0.041
	1,2,3,4–Tetrachlorobenzene	0.003	*	*	*	*	*	*	0.001	*	*
	1,2,3,5–Tetrachlorobenzene	0.002	*	*	*	*	*	*	*	*	*
	1,2,3–Trichlorobenzene	0.005	*	*	*	*	*	*	*	*	*
	1,2,4,5–Tetrachlorobenzene	0.005	*	*	*	*	*	*	*	*	*
	1,2,4–Trichlorobenzene	0.013	*	*	0.001	*	*	*	0.012	0.001	0.002

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	IN 0100	PR 1200	PR 1600	PR 1700	PR 1900	PR 2000	PR 2100	CO 0200	CO 0500	CO 0600
	2,4,5–Trichlorotoluene	0.006	*	*	0.001	*	*	*	0.006	*	0.001
	Hexachlorobenzene	0.003	*	*	0.001	*	*	*	0.002	*	*
	Hexachlorobutadiene	0.007	*	*	*	*	*	*	0.007	*	0.001
	Hexachlorocyclopentadiene	0.003	*	*	*	*	*	*	*	*	*
	Hexachloroethane	0.004	*	0.002	*	*	*	*	0.008	*	*
	Octachlorostyrene	0.007	*	*	*	*	*	*	0.001	*	0.001
	Pentachlorobenzene	0.003	*	*	*	*	*	*	0.001	*	*
	Octachlorodibenzo–p–dioxin	*	*	–	–	*	–	–	*	*	*
	Octachlorodibenzofuran	*	*	–	–	*	–	–	*	*	*
	Total H6CDD	*		–	–	*	–	–	*	*	*
	Total H6CDF	*	*	–	–	*	–	–	*	*	*
	Total H7CDD	*	*	–	–	*	–	–	*	*	*
	Total H7CDF	*	*	–	–	*	–	–	*	*	*
	Total PCDD	*	*	–	–	*	–	–	*	*	*
	Total PCDF	*	*	–	–	*	–	–	*	*	*
	Total TCDD	*	*	–	–	*	–	–	*	*	*
	Total TCDF	*	*	–	–	*	–	–	*	*	*
	PCBT	0.040	*	*	*	*	*	*	0.003	0.001	0.003

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	CO 0700	CO 0900	OT 0300	OT 1000	WA 2200	WA 2300	TOTAL
o	DOC	251.163	1470.354	172.189	36.383	69.751	19.464	2394.665
o	TOC	224.034	1356.712	110.580	28.210	70.343	19.720	2141.810
o	COD	3088.904	5327.222	–	–	–	–	9334.030
o	Ammonia plus Ammonium	3.513	14.235	–	–	–	–	23.440
o	Nitrate+Nitrite	31.426	167.084	–	3.564	–	–	243.036
o	Total Kjeldahl nitrogen	68.497	407.111	–	–	–	–	629.778
o	Total suspended solids	652.177	3601.023	270.249	201.599	255.718	31.394	6016.100
o	VSS	337.793	1839.960	–	–	57.082	10.430	2688.270
o	Total phosphorus	13.094	98.732	3.576	1.062	1.236	1.114	129.892
o	Oil and grease	128.795	648.180	130.570	13.651	5.284	3.448	1144.162
	Cyanide Total	0.532	2.847	–	–	–	–	4.118
	Aluminum	3.659	44.305	–	–	2.041	0.793	62.441
	Boron	1.013	5.520	–	–	0.217	0.103	8.863
	Chromium	0.338	3.680	–	–	0.416	0.011	5.105
	Copper	0.399	4.293	–	–	0.042	0.012	5.232
	Lead	2.702	22.080	–	–	0.122	0.035	28.487
	Molybdenum	0.676	6.133	–	–	0.108	0.036	7.940
	Nickel	0.676	11.040	–	–	0.030	0.011	12.643
	Vanadium	1.842	3.047	–	–	0.214	0.093	7.610
	Zinc	0.338	173.758	–	–	0.032	0.029	174.608
	Arsenic	0.068	0.368	–	–	–	–	0.524
	Mercury	0.009	0.052	–	0.001	0.001	0.001	0.080
	Phenolics (4AAP)	0.836	4.829	0.269	0.086	0.111	0.010	6.929
	Sulphide	5.736	27.699	–	–	–	–	40.160
	1,1,2,2–Tetrachloroethane	0.087	0.462	0.048	0.010	–	–	0.733
	1,1,2–Trichloroethane	0.034	0.178	0.019	0.004	–	–	0.394
	1,1–Dichloroethane	0.034	0.178	0.019	0.004	–	–	0.342
	1,1–Dichloroethylene	0.050	0.266	0.030	0.005	–	–	0.425
	1,2–Dichloroethane	0.052	0.867	0.027	0.133	–	–	2.488

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	CO 0700	CO 0900	OT 0300	OT 1000	WA 2200	WA 2300	TOTAL
	1,2–Dichloropropane	0.027	0.146	0.015	0.003	–	–	1.141
	Bromodichloromethane	0.032	0.171	0.018	0.004	–	–	0.268
	Bromoform	0.060	0.316	0.034	0.006	–	–	0.499
	Carbon tetrachloride	0.151	0.732	0.071	0.016	–	–	2.885
	Chloroform	0.058	0.305	0.034	0.007	–	–	0.536
	Chloromethane	1.667	6.501	1.181	0.072	–	–	11.777
	Methylene chloride	0.044	0.235	0.025	0.005	–	–	0.597
	Tetrachloroethylene	0.083	0.459	0.063	0.036	–	–	3.326
	Trichloroethylene	0.049	0.260	0.027	0.006	–	–	0.616
	Vinyl chloride	0.252	1.191	0.052	0.019	–	–	1.701
	Benzene	0.029	0.194	–	0.003	–	–	0.284
	Ethylbenzene	0.067	0.550	–	0.005	–	–	0.673
	2,6–Dinitrotoluene	0.420	1.193	–	–	–	–	1.835
	2–Chloronaphthalene	0.315	1.717	–	–	–	–	2.445
	Biphenyl	0.113	0.613	–	–	–	–	0.874
	Bis(2–chloroethyl)ether	0.158	0.859	–	–	–	–	1.224
	Bis(2–chloroisopropyl)ether	0.135	3.142	–	–	–	–	3.726
	Bis(2–ethylhexyl) phthalate	0.107	0.287	–	–	–	–	0.562
	Di–n–butyl phthalate	0.158	0.859	–	–	–	–	1.330
	N–Nitrosodi–n–propylamine	0.101	0.552	–	–	–	–	0.798
	Naphthalene	0.248	1.349	–	–	–	–	1.922
	Phenanthrene	0.011	0.061	–	–	–	–	0.087
	2,3,4,5–Tetrachlorophenol	0.053	0.285	*	0.005	–	–	0.416
	2,3,4–Trichlorophenol	0.075	0.399	*	0.002	–	–	0.579
	1,2,3,4–Tetrachlorobenzene	*	0.004	*	–	–	–	0.005
	1,2,3,5–Tetrachlorobenzene	*	0.002	*	–	–	–	0.002
	1,2,3–Trichlorobenzene	0.001	0.004	*	–	–	–	0.005
	1,2,4,5–Tetrachlorobenzene	0.001	0.004	*	–	–	–	0.005
	1,2,4–Trichlorobenzene	0.002	0.008	0.001	–	–	–	0.026

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DOW CHEMICAL CANADA INC. – SARNIA

	PARAMETER	CO 0700	CO 0900	OT 0300	OT 1000	WA 2200	WA 2300	TOTAL
	2,4,5–Trichlorotoluene	0.001	0.010	0.001	–	–	–	0.019
	Hexachlorobenzene	*	0.002	0.001	–	–	–	0.005
	Hexachlorobutadiene	0.001	0.004	0.001	–	–	–	0.014
	Hexachlorocyclopentadiene	0.001	0.003	*	–	–	–	0.004
	Hexachloroethane	0.001	0.004	*	–	–	–	0.013
	Octachlorostyrene	0.001	0.006	0.001	–	–	–	0.010
	Pentachlorobenzene	0.001	0.003	*	–	–	–	0.005
	Octachlorodibenzo–p–dioxin	*	*	–	–	–	–	*
	Octachlorodibenzofuran	*	*	–	–	–	–	*
	Total H6CDD	*	*	–	–	–	–	*
	Total H6CDF	*	*	–	–	–	–	*
	Total H7CDD	*	*	–	–	–	–	*
	Total H7CDF	*	*	–	–	–	–	*
	Total PCDD	*	*	–	–	–	–	*
	Total PCDF	*	*	–	–	–	–	*
	Total TCDD	*	*	–	–	–	–	*
	Total TCDF	*	*	–	–	–	–	*
	PCBT	0.006	0.030	–	–	–	–	0.043

EXPLANATORY NOTES:
'–' not required in the regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0100 – Intake Water to Site
PR 1200 – Throx Stripper Effluent flows into CO 0500
PR 1600 – Block 90 Feed (Building 88) flows into CO 0900
PR 1700 – Block 90 Feed (Building 35 & 39) flow into CO 0900
PR 1900 – Biox Plant Effluent flows onto CO 0900
PR 2000 – Boiler Feedwater Effluent flows into CO 0900
PR 2100 – Scott Road Treated Runoff to River
CO 0200 – 42 inch Outfall to River

CO 0500 – 54 inch Sluice Outfall to River
CO 0600 – 2nd Street Outfall to River
CO 0700 – 3rd Street Outfall to River
CO 0900 – 4th Street Outfall to River
OT 0300 – 48 inch Outfall to River
OT 1000 – 5th Street Outfall to River
WA 2200 – Lasalle Road Runoff to River
WA 2300 – Lasalle Road Runoff to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – DU PONT CANADA INC. – CORUNNA

	PARAMETER	UNIT	IN 0100	CO 0200	CO 0400
o	DOC	mg/L	3.5	3.8	3.6
o	TOC	mg/L	3	5	4
o	COD	mg/L	14	21	86
o	Ammonia plus Ammonium	mg/L	0.20	0.10	0.03
o	Nitrate+Nitrite	mg/L	0.30	0.35	0.41
o	Total Kjeldahl nitrogen	mg/L	0.7	0.5	0.5
o	Total suspended solids	mg/L	7	8	12
o	VSS	mg/L	4	8	13
o	Total phosphorus	mg/L	0.1	0.1	0.1
o	Hydrogen ion (pH)		7.9	7.9	7.9
o	Specific conductance	uS/cm	278	293	326
o	Oil and grease	mg/L	1.5	1.7	1.8
	Aluminum	ug/L	152.2	273.0	291.7
	Copper	ug/L	3.2	6.8	13.2
	Zinc	ug/L	8.8	15.7	28.5
	Phenolics (4AAP)	ug/L	1.9	2.9	2.8
	Toluene	ug/L	0.4	3.0	4.5
	Ftflow	m3/day	45110	49943	11187

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0100 – Intake Water to Site
CO 0200 – Final Effluent to River
CO 0400 – Pellet Pond Effluent flows into CO 0200

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – DU PONT CANADA INC. – CORUNNA

	PARAMETER	IN 0100	CO 0200	CO 0400	TOTAL
o	DOC	160.711	185.727	38.910	185.727
o	TOC	126.118	214.035	46.302	214.035
o	COD	611.800	1213.800	971.800	1213.800
o	Ammonia plus Ammonium	4.559	4.823	0.282	4.823
o	Nitrate+Nitrite	13.110	20.230	4.633	20.230
o	Total Kjeldahl nitrogen	28.366	23.813	5.650	23.813
o	Total suspended solids	307.356	393.003	133.581	393.003
o	VSS	152.950	462.400	146.900	462.400
o	Total phosphorus	4.445	4.134	1.208	4.134
o	Oil and grease	70.905	81.909	22.803	81.909
	Aluminum	6.805	14.471	3.134	14.471
	Copper	0.128	0.343	0.134	0.343
	Zinc	0.391	0.820	0.295	0.820
	Phenolics (4AAP)	0.093	0.148	0.032	0.148
	Toluene	0.018	0.129	0.041	0.129

EXPLANATORY NOTES:
'o' – conventional parameter

SAMPLING POINTS:
IN 0100 – Intake Water to Site
CO 0200 – Final Effluent to River
CO 0400 – Pellet Pond Effluent flows into CO 0200

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – ESSO CHEMICAL CANADA – SARNIA

	PARAMETER	UNIT	IN 0100	PR 0200	CO 0300
o	DOC	mg/L	2.5	4.9	7.7
o	TOC	mg/L	3	5	8
o	COD	mg/L	9	42	40
o	Ammonia plus Ammonium	mg/L	0.10	0.10	0.10
o	Nitrate+Nitrite	mg/L	0.32	0.42	0.30
o	Total Kjeldahl nitrogen	mg/L	0.2	0.3	0.2
o	Total suspended solids	mg/L	11	6	6
o	VSS	mg/L	3	4	8
o	Total phosphorus	mg/L	0.02	0.02	0.02
o	Hydrogen ion (pH)		8.1	7.8	8.0
o	Specific conductance	uS/cm	174	278	219
o	Oil and grease	mg/L	1.1	1.2	1.4
	Cyanide Total	mg/L	0.005	0.023	0.010
	Aluminum	ug/L	163.3	93.3	58.3
	Copper	ug/L	17.0	23.1	29.8
	Zinc	ug/L	6.6	23.7	25.0
	Bromodichloromethane	ug/L	0.2	0.2	0.9
	Chloroform	ug/L	0.2	0.6	2.5
	Benzene	ug/L	0.3	2.1	1.9
	Toluene	ug/L	0.3	5.3	9.9
	m–Xylene and p–Xylene	ug/L	0.2	8.6	8.6
	o–Xylene	ug/L	0.2	4.3	4.4
	Bis(2–ethylhexyl) phthalate	ug/L	8.0	2.0	5.1
	2,3,4,5–Tetrachlorophenol	ug/L	0.5	0.5	0.5
	2,3,4–Trichlorophenol	ug/L	0.7	0.7	0.7
	2,4,5–Trichlorotoluene	ng/L	5.0	5.0	7.5
	Hexachlorobutadiene	ng/L	5.0	181.5	35.0
	Hexachloroethane	ng/L	5.0	70.0	16.0
	Ftflow	m3/day	–	1979	28243

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS:
IN 0100 – Intake Water to Site
PR 0200 – Carbon Contactor Effluent flows into CO 0300
CO 0300 – Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – ESSO CHEMICAL CANADA – SARNIA

	PARAMETER	IN 0100	PR 0200	CO 0300	TOTAL
o	DOC	71.173	10.137	217.337	217.337
o	TOC	81.651	10.829	231.986	231.986
o	COD	240.066	95.053	1028.360	1028.360
o	Ammonia plus Ammonium	2.824	0.247	2.600	2.600
o	Nitrate+Nitrite	9.038	1.061	7.695	7.695
o	Total Kjeldahl nitrogen	6.213	0.796	5.982	5.982
o	Total suspended solids	297.428	12.723	186.830	186.830
o	VSS	90.378	8.434	198.151	198.151
o	Total phosphorus	0.593	0.049	0.649	0.649
o	Oil and grease	30.079	2.167	39.765	39.765
	Cyanide Total	0.141	0.046	0.274	0.274
	Aluminum	4.613	0.182	1.608	1.608
	Copper	0.479	0.045	0.863	0.863
	Zinc	0.188	0.049	0.738	0.738
	Bromodichloromethane	0.006	*	0.026	0.026
	Chloroform	0.006	0.001	0.069	0.069
	Benzene	0.007	0.008	0.052	0.052
	Toluene	0.007	0.018	0.295	0.295
	m–Xylene and p–Xylene	0.006	0.028	0.253	0.253
	o–Xylene	0.006	0.014	0.126	0.126
	Bis(2–ethylhexyl) phthalate	0.226	0.005	0.133	0.133
	2,3,4,5–Tetrachlorophenol	0.013	0.001	0.012	0.012
	2,3,4–Trichlorophenol	0.020	0.002	0.018	0.018
	2,4,5–Trichlorotoluene	*	*	*	*
	Hexachlorobutadiene	*	*	0.001	0.001
	Hexachloroethane	*	*	*	*

EXPLANATORY NOTES:
'–' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0100 – Intake Water to Site
PR 0200 – Carbon Contactor Effluent flows into CO 0300
CO 0300 – Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90
PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – ETHYL CANADA INC. – CORUNNA

	PARAMETER	UNIT	IN 0800	PR 0200	PR 0300	CO 0100
o	DOC	mg/L	–	5.3	14.3	2.0
o	TOC	mg/L	–	11	20	4
o	COD	mg/L	–	275	1600	35
o	Ammonia plus Ammonium	mg/L	–	0.05	0.74	0.61
o	Nitrate+Nitrite	mg/L	–	2.86	0.20	0.40
o	Total Kjeldahl nitrogen	mg/L	–	0.7	1.5	1.5
o	Total suspended solids	mg/L	–	12	45	11
o	VSS	mg/L	–	18	11	8
o	Total phosphorus	mg/L	–	0.1	0.1	0.3
o	Hydrogen ion (pH)		–	3.5	9.1	7.9
o	Specific conductance	uS/cm	–	16293	99535	3181
o	Oil and grease	mg/L	–	6.2	4.3	1.6
	Aluminum	ug/L	–	15720.3	21733.5	3536.7
	Boron	ug/L	–	25.2	2600.0	69.2
	Chromium	ug/L	–	59.7	6.8	3.3
	Copper	ug/L	–	126.7	7.3	13.3
	Lead	ug/L	–	398.7	21924.2	590.1
	Nickel	ug/L	–	134.8	9.5	9.0
	Thallium	ug/L	–	51.5	15.0	10.0
	Zinc	ug/L	–	113.7	85.0	24.8
	Mercury	ug/L	–	0.24	0.23	0.41
	Tetra–alkyl lead (Total)	ug/L	–	3.6	46.7	4.5
	Tri–alkyl lead (Total)	ug/L	–	216.5	476.4	28.9
	Phenolics (4AAP)	ug/L	–	10.0	261.9	7.8
	Sulphide	ug/L	–	120.0	155.0	30.0
	1,1–Dichloroethane	ug/L	–	2355.8	2.4	224.0
	1,2–Dichloroethane	ug/L	–	80.7	221.5	145.2
	Chloroform	ug/L	–	24.9	8.3	32.1
	Chloromethane	ug/L	–	425.8	140.1	34.0
	Ethylene dibromide	ug/L	–	61.5	122.9	5.7
	Methylene chloride	ug/L	–	1363.0	1571.0	83.5
	Toluene	ug/L	–	0.4	241.8	31.2
	1–Methylnaphthalene	ug/L	–	2.2	23.4	2.2
	2–Methylnaphthalene	ug/L	–	1.5	10.3	1.5
	Biphenyl	ug/L	–	0.4	4.1	0.4
	Bis(2–chloroethoxy)methane	ug/L	–	1.3	1.3	1.3
	Di–n–octyl phthalate	ug/L	–	0.8	1.2	0.8
	Indole	ug/L	–	1.2	518.8	6.1
	2,3,4,5–Tetrachlorophenol	ug/L	–	0.9	0.4	0.4
	Phenol	ug/L	–	1.1	38.0	1.1
	m–Cresol	ug/L	–	3.0	5.7	3.0
	o–Cresol	ug/L	–	1.7	6.5	1.7
	p–Cresol	ug/L	–	3.5	5.7	3.5
	Ftflow	m3/day	–	179	590	33891

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter
SAMPLING POINTS
IN 0800 – Intake Water to Site
CO 0100 – Final Effluent to River
PR 0200 – Neutralization Pit Effluent flows into CO 0100
PR 0300 – TEL Process Effluent flows into CO 0100

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90
PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – ETHYL CANADA INC. – CORUNNA

	PARAMETER	IN 0800	PR 0200	PR 0300	CO 0100	TOTAL
o	DOC	–	0.932	7.655	66.172	66.172
o	TOC	–	2.074	10.615	110.313	110.313
o	COD	–	59.800	793.600	1373.279	1373.279
o	Ammonia plus Ammonium	–	0.009	0.367	22.474	22.474
o	Nitrate+Nitrite	–	0.505	0.099	14.469	14.469
o	Total Kjeldahl nitrogen	–	0.126	0.734	57.057	57.057
o	Total suspended solids	–	2.425	29.349	368.224	368.224
o	VSS	–	3.635	5.580	301.347	301.347
o	Total phosphorus	–	0.017	0.072	9.256	9.256
o	Oil and grease	–	1.104	2.808	54.177	54.177
	Aluminum	–	3.129	13.616	131.371	131.371
	Boron	–	0.005	1.802	2.562	2.562
	Chromium	–	0.011	0.005	0.126	0.126
	Copper	–	0.022	0.005	0.484	0.484
	Lead	–	0.080	16.564	20.011	20.011
	Nickel	–	0.024	0.007	0.346	0.346
	Thallium	–	0.009	0.010	0.385	0.385
	Zinc	–	0.021	0.055	0.913	0.913
	Mercury	–	*	*	0.015	0.015
	Tetra–alkyl lead (Total)	–	0.001	0.034	0.151	0.151
	Tri–alkyl lead (Total)	–	0.056	0.298	1.035	1.035
	Phenolics (4AAP)	–	0.002	0.124	0.294	0.294
	Sulphide	–	0.027	0.077	1.233	1.233
	1,1–Dichloroethane	–	0.557	0.001	7.908	7.908
	1,2–Dichloroethane	–	0.017	0.108	5.809	5.809
	Chloroform	–	0.006	0.011	1.099	1.099
	Chloromethane	–	0.078	0.068	1.347	1.347
	Ethylene dibromide	–	0.015	0.054	0.217	0.217
	Methylene chloride	–	0.316	0.803	2.879	2.879
	Toluene	–	*	0.201	1.142	1.142
	1–Methylnaphthalene	–	*	0.015	0.085	0.085
	2–Methylnaphthalene	–	*	0.007	0.058	0.058
	Biphenyl	–	*	0.002	0.015	0.015
	Bis(2–chloroethoxy)methane	–	*	0.001	0.050	0.050
	Di–n–octyl phthalate	–	*	0.001	0.031	0.031
	Indole	–	*	0.347	0.225	0.225
	2,3,4,5–Tetrachlorophenol	–	*	*	0.016	0.016
	Phenol	–	*	0.019	0.044	0.044
	m–Cresol	–	0.001	0.003	0.120	0.120
	o–Cresol	–	*	0.003	0.068	0.068
	p–Cresol	–	0.001	0.003	0.140	0.140

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0800 – Intake Water to Site
CO 0100 – Final Effluent to River
PR 0200 – Neutralization Pit Effluent flows into CO 0100
PR 0300 – TEL Process Effluent flows into CO 0100

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – NOVACOR CHEMICALS LTD. – MOORETOWN

	PARAMETER	UNIT	IN 0600	CO 0100
o	DOC	mg/L	0.8	4.7
o	TOC	mg/L	1	6
o	COD	mg/L	9	12
o	Ammonia plus Ammonium	mg/L	0.03	0.42
o	Nitrate+Nitrite	mg/L	0.20	0.57
o	Total Kjeldahl nitrogen	mg/L	0.2	1.0
o	Total suspended solids	mg/L	5	14
o	VSS	mg/L	–	4
o	Total phosphorus	mg/L	0.1	0.4
o	Hydrogen ion (pH)		7.8	8.1
o	Specific conductance	uS/cm	225	652
o	Oil and grease	mg/L	1.0	1.3
	Aluminum	ug/L	60.0	683.3
	Zinc	ug/L	9.0	51.9
	Ftflow	m3/day	–	1574

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0600 – Intake Water to Site
CO 0100 – Final Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – NOVACOR CHEMICALS LTD. – MOORETOWN

	PARAMETER	IN 0600	CO 0100	TOTAL
o	DOC	1.286	7.384	7.384
o	TOC	0.787	8.720	8.720
o	COD	14.322	18.504	18.504
o	Ammonia plus Ammonium	0.039	0.648	0.648
o	Nitrate+Nitrite	0.315	0.879	0.879
o	Total Kjeldahl nitrogen	0.252	1.542	1.542
o	Total suspended solids	7.318	22.904	22.904
o	VSS	–	6.580	6.580
o	Total phosphorus	0.109	0.629	0.629
o	Oil and grease	1.511	1.982	1.982
	Aluminum	0.094	1.105	1.105
	Zinc	0.005	0.083	0.083

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'o' – conventional parameter

SAMPLING POINTS:
IN 0600 – Intake Water to Site
CO 0100 – Final Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – POLYSAR LTD. – SARNIA

	PARAMETER	UNIT	IN 2400	PR 0300	PR 0900	PR 1800	CO 0200	CO 0400	CO 0500	OT 1400	BA 1700	CO 1100 @@
o	DOC	mg/L	3.9	5.1	13.2	19.5	3.9	3.9	3.8	4.3	9.6	4.4
o	TOC	mg/L	3.0	5	14	18	7	2	4	–	7	4
o	COD	mg/L	20	13	27	63	10	10	30	–	22	10
o	Ammonia plus Ammonium	mg/L	0.2	0.16	0.20	1.79	0.14	0.13	0.07	–	1.40	0.11
o	Nitrate+Nitrite	mg/L	0.4	0.06	0.05	1.73	0.34	0.32	0.30	–	3.00	0.43
o	Total Kjeldahl nitrogen	mg/L	0.6	0.2	0.6	2.8	0.3	0.2	0.2	–	1.1	0.2
o	Total suspended solids	mg/L	5.0	41	26	15	5	4	4	5	11	5
o	VSS	mg/L	4	6	4	8	4	4	4	–	5	4
o	Total phosphorus	mg/L	0.1	0.2	0.3	0.8	0.1	0.1	0.1	0.1	0.1	0.1
o	Hydrogen ion (pH)		8.1	7.6	7.5	7.6	8.1	8.1	8.3	8.1	7.6	8.1
o	Specific conductance	uS/cm	217.1	226	451	2549	217	229	225	217	4989	310
o	Oil and grease	mg/L	1.0	2.5	6.6	4.0	1.2	1.3	2.1	1.5	6.1	2.0
	Cyanide Total	mg/L	0.001	0.001	0.001	0.003	0.001	0.001	0.001	–	0.003	0.001
	Aluminum	ug/L	87.2	8973.2	4226.6	1612.5	188.3	110.7	59.0	105.0	256.5	91.0
	Boron	ug/L	12.8	12.5	17.6	30.3	13.5	12.3	15.0	12.8	58.0	42.0
	Cobalt	ug/L	2.1	455.8	2.3	2.2	13.3	2.4	2.0	2.0	2.7	2.0
	Copper	ug/L	3.7	3.3	5.7	6.6	3.3	4.3	11.5	6.7	6.8	6.0
	Molybdenum	ug/L	3.0	3.0	3.1	14.4	3.0	3.0	3.0	3.0	3.9	3.0
	Nickel	ug/L	9.0	9.5	9.0	27.5	9.0	9.0	9.0	9.0	9.0	9.0
	Zinc	ug/L	8.7	10.6	983.9	25.3	7.5	27.4	12.5	10.8	21.0	11.7
	Antimony	ug/L	3.8	3.0	3.5	4.8	3.0	5.0	3.0	–	12.0	3.2
	Chromium (hexavalent)	ug/L	20.0	–	20.0	–	–	10.5	–	–	–	–
	Mercury	ug/L	0.03	0.02	0.04	0.05	0.04	0.04	0.21	–	0.03	0.04
	Phenolics (4AAP)	ug/L	1.4	13.1	9.7	5.3	4.5	1.4	2.5	–	17.5	2.9
	Sulphide	ug/L	28.0	30.0	50.0	210.0	35.0	20.0	50.0	–	75.0	65.0
	Bromoform	ug/L	0.4	0.5	0.4	9.9	0.4	0.4	0.4	0.4	0.4	4.5
	Bromomethane	ug/L	2.4	52.3	4873.6	2.4	2.4	118.9	2.4	2.4	2.4	2.4
	Chloroform	ug/L	0.4	30.5	59.4	10.0	0.7	0.9	5.4	0.7	0.5	2.0
	Chloromethane	ug/L	2.3	263.6	81681.6	2.3	2.3	1941.4	2.3	2.3	2.3	2.5
	Methylene chloride	ug/L	0.7	41.7	169.3	0.4	3.1	0.3	0.4	0.3	0.3	0.3
	Benzene	ug/L	0.3	3560.4	32.3	1.1	31.3	3.9	1.1	0.2	0.6	1.0
	Ethylbenzene	ug/L	0.4	0.4	0.4	0.4	0.4	1.0	0.8	0.5	1.8	0.4

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – POLYSAR LTD. – SARNIA

	PARAMETER	UNIT	IN 2400	PR 0300	PR 0900	PR 1800	CO 0200	CO 0400	CO 0500	OT 1400	BA 1700	@@ CO 1100
	Styrene	ug/L	0.4	0.4	0.4	0.4	0.4	0.8	0.4	0.4	0.4	1.1
	Toluene	ug/L	1.0	30.2	30.5	1.1	2.4	1.2	3.8	0.5	0.4	2.2
	Benzylbutylphthalate	ug/L	0.6	0.6	0.9	0.6	0.6	0.6	0.6	–	0.6	0.6
	Bis(2–ethylhexyl) phthalate	ug/L	1.5	1.4	2.1	8.2	3.3	3.2	1.4	–	3.1	1.6
	Di–n–octyl phthalate	ug/L	1.0	0.8	6.9	2.6	0.8	7.9	0.8	–	0.8	0.8
	2,6–Dichlorophenol	ug/L	1.1	1.1	1.1	1.1	1.1	1.1	1.1	–	3.6	1.1
	1,2,4–Trichlorobenzene	ng/L	6.1	55.1	6.1	7.3	6.7	6.1	6.1	–	16.1	8.3
	2,4,5–Trichlorotoluene	ng/L	4.3	2.8	3.9	4.3	2.8	2.8	3.7	–	2.7	100.0
	Hexachlorobenzene	ng/L	5.6	9.8	3.8	3.5	4.7	12.5	5.0	–	4.0	17.3
	Hexachlorobutadiene	ng/L	6.5	5.9	2.7	4.3	16.0	5.3	7.0	–	2.5	65.0
	Pentachlorobenzene	ng/L	2.6	2.7	2.1	2.5	3.4	2.6	3.6	–	2.1	8.2
	Ftflow	m3/day	–	2619	2710	12688	71367	144657	167450	69519	**	103115
	Volume Discharged–Total	m3	**	**	**	**	**	**	**	**	413	**

EXPLANTATORY CODES:
'–' no concentration data available or not required by regulation
'**' parameter does not pertain to this stream
'o' – conventional parameter

SAMPLING POINTS
IN 2400 – Intake Water
PR 0300 – Crumb Separator flows into CO 0200
PR 0900 – Butyl II flows into CO 0400
BA 1700 – Neutralization Sump to River
PR 1800 – Blox Effluent to River
CO 0200 – 72 inch Sewer to River
CO 0400 – 66 inch Sewer to River
CO 0500 – 54 inch Sewer to River
OT 1400 – Turbine Cooling Water to River
@@ CO 1100 – Cole Drain to River draining numerous plant sites – monitored by Polysar

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – POLYSAR LTD. – SARNIA

	PARAMETER	IN 2400	PR 0300	PR 0900	PR 1800	CO 0200	CO 0400	CO 0500	OT 1400	BA 1700	TOTAL	@@ CO 1100
o	DOC	1811.967	15.365	39.062	306.433	284.611	581.513	646.862	195.644	3.974	2019.037	403.449
o	TOC	1410.550	13.276	40.369	262.527	488.471	213.966	749.606	–	3.000	1717.570	385.116
o	COD	9406.769	38.862	73.242	882.791	726.181	1442.568	5202.282	–	10.368	8264.190	864.331
o	Ammonia plus Ammonium	83.357	0.492	0.536	26.603	10.844	23.948	11.647	–	0.562	73.604	9.920
o	Nitrate+Nitrite	187.204	0.196	0.115	9.932	25.241	45.379	51.386	–	1.598	133.536	40.841
o	Total Kjeldahl nitrogen	284.531	0.558	1.549	37.965	26.776	26.891	27.810	–	0.069	119.511	14.429
o	Total suspended solids	2777.791	77.091	59.418	199.812	341.050	630.078	746.801	296.511	4.452	2218.704	548.470
o	VSS	1698.341	18.676	9.612	95.969	289.510	588.226	651.293	–	1.512	1626.510	334.365
o	Total phosphorus	43.774	0.598	0.889	9.921	9.099	20.356	23.907	6.187	0.054	69.524	10.733
o	Oil and grease	473.598	6.731	14.579	51.459	83.794	181.495	354.012	146.225	2.483	819.468	210.639
	Cyanide Total	0.466	0.002	0.003	0.056	0.035	0.056	0.088	–	0.002	0.237	0.035
	Aluminum	40.626	15.596	10.523	17.608	14.029	16.992	10.188	3.409	0.126	62.352	7.386
	Boron	5.942	0.034	0.049	0.378	0.985	1.933	2.599	0.823	0.027	6.745	3.510
	Cobalt	0.969	1.191	0.006	0.027	0.966	0.350	0.348	0.139	0.001	1.831	0.168
	Copper	1.714	0.009	0.015	0.083	0.244	0.612	1.990	0.391	0.003	3.323	0.481
	Molybdenum	1.410	0.008	0.008	0.180	0.220	0.449	0.521	0.209	0.002	1.581	0.252
	Nickel	4.191	0.025	0.024	0.350	0.660	1.348	1.564	0.626	0.004	4.552	0.757
	Zinc	4.042	0.029	2.389	0.353	0.559	4.308	2.172	0.792	0.010	8.194	0.967
	Antimony	1.770	0.009	0.009	0.066	0.230	0.686	0.521	–	0.006	1.509	0.265
	Chromium (hexavalent)	9.314	–	–	–	–	1.322	–	–	–	1.322	–
	Mercury	0.016	*	*	0.001	0.003	0.005	0.037	–	*	0.046	0.003
	Phenolics (4AAP)	0.637	0.042	0.028	0.066	0.332	0.228	0.430	–	0.005	1.061	0.255
	Sulphide	13.039	0.092	0.133	2.861	2.783	3.081	8.691	–	0.030	17.446	6.234
	Bromoform	0.178	0.001	0.001	0.108	0.027	0.055	0.074	0.026	0.004	0.294	0.331
	Bromomethane	1.137	0.154	10.397	0.030	0.173	16.726	0.427	0.167	0.001	17.524	0.235
	Chloroform	0.202	0.087	0.205	0.141	0.053	0.113	0.924	0.033	0.007	1.271	0.150
	Chloromethane	1.071	0.895	222.567	0.029	0.166	251.928	0.409	0.160	0.001	252.693	0.238
	Methylene chloride	0.340	0.115	0.424	0.006	0.227	0.045	0.064	0.021	0.003	0.366	0.029
	Benzene	0.141	8.003	0.144	0.020	2.175	0.723	0.182	0.015	0.007	3.122	0.093
	Ethylbenzene	0.205	0.001	0.001	0.006	0.029	0.133	0.146	0.030	0.001	0.345	0.039

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – POLYSAR LTD. – SARNIA

	PARAMETER	IN 2400	PR 0300	PR 0900	PR 1800	CO 0200	CO 0400	CO 0500	OT 1400	BA 1700	TOTAL	@@ CO 1100
	Styrene	0.186	0.001	0.001	0.005	0.029	0.141	0.071	0.028	0.004	0.278	0.106
	Toluene	0.465	0.097	0.080	0.015	0.170	0.193	0.652	0.039	0.004	1.073	0.170
	Benzylbutylphthalate	0.279	0.002	0.002	0.008	0.046	0.092	0.104	–	0.007	0.257	0.054
	Bis(2–ethylhexyl) phthalate	0.684	0.004	0.006	0.119	0.261	0.412	0.244	–	0.002	1.038	0.152
	Di–n–octyl phthalate	0.488	0.002	0.016	0.012	0.061	0.919	0.139	–	0.009	1.140	0.072
	2,6–Dichlorophenol	0.512	0.003	0.003	0.014	0.084	0.166	0.191	–	0.066	0.521	0.093
	1,2,4–Trichlorobenzene	0.003	*	*	*	*	0.001	0.001	–	*	0.002	0.001
	2,4,5–Trichlorotoluene	0.002	*	*	*	*	*	0.001	–	*	0.001	0.008
	Hexachlorobenzene	0.003	*	*	*	*	0.002	0.001	–	*	0.003	0.002
	Hexachlorobutadiene	0.003	*	*	*	0.001	0.001	0.001	–	*	0.003	0.006
	Pentachlorobenzene	0.001	*	*	*	*	*	0.001	–	*	0.001	0.001

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 2400 – Intake Water
PR 0300 – Crumb Separator flows into CO 0200
PR 0900 – Butyl II flows into CO 0400
PR 1800 – Biox Effluent to River
CO 0200 – 72 inch Sewer to River
CO 0400 – 66 inch Sewer to River
CO 0500 – 54 inch Sewer to River
OT 1400 – Turbine Cooling Water to River
BA 1700 – Neutralization Sump to River
@@ CO 1100 – Cole Drain to River draining numerous plant sites – monitored by Polysar

APPENDIX E

SIX-MONTH AVERAGE CONCENTRATION/LOADING TABLES BY INDIVIDUAL CONTROL POINTS FOR EACH PLANT

THE LAKE ERIE/ONTARIO BASIN PLANTS

	PAGE
B.F. GOODRICH CANADA INC. - THOROLD	E-2
CANADIANOXY CHEMICALS LTD. - FORT ERIE	E-4
CELANESE CANADA INC. - MILLHAVEN	E-6
DUPONT CANADA INC. - KINGSTON	E-8
G.E. PLASTICS CANADA LTD. - COBOURG	E-12
STEPAN CANADA INC. - LONGFORD MILLS	E-14
UNIROYAL CHEMICAL LTD. - ELMIRA	E-16

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – B.F. GOODRICH CANADA INC. – THOROLD

	PARAMETER	UNIT	IN 0600	PR 0100
o	DOC	mg/L	9.8	15.8
o	TOC	mg/L	9	23
o	COD	mg/L	45	26
o	Ammonia plus Ammonium	mg/L	0.21	0.27
o	Nitrate+Nitrite	mg/L	1.70	0.97
o	Total Kjeldahl nitrogen	mg/L	0.8	1.3
o	Total suspended solids	mg/L	27	26
o	VSS	mg/L	4	15
o	Total phosphorus	mg/L	0.1	0.1
o	Hydrogen ion (pH)		7.7	7.7
o	Specific conductance	uS/cm	329	1146
o	Oil and grease	mg/L	1.0	1.0
	Cyanide Total	mg/L	0.005	0.108
	Aluminum	ug/L	462.7	508.7
	Boron	ug/L	44.0	59.0
	Zinc	ug/L	17.0	30.5
	Mercury	ug/L	2.05	0.10
	Phenolics (4AAP)	ug/L	8.0	11.2
	Chloroform	ug/L	0.7	11.1
	Methylene chloride	ug/L	3.0	1.8
	Trichloroethylene	ug/L	0.4	8.6
	Vinyl chloride	ug/L	0.9	266.2
	Benzene	ug/L	0.5	0.2
	Toluene	ug/L	0.8	0.4
	1,2,3,5–Tetrachlorobenzene	ng/L	10.0	10.9
	Octachlorodibenzo–p–dioxin	pg/L	250.0	380.0
	Ftflow	m3/day	–	2987

Explanatory Notes:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0600 – Intake Water to Site
PR 0100 – Final Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – B.F. GOODRICH CANADA INC. – THOROLD

	PARAMETER	IN 0600	PR 0100	TOTAL
o	DOC	29.277	48.882	48.882
o	TOC	26.388	70.965	70.965
o	COD	134.434	60.044	60.044
o	Ammonia plus Ammonium	0.633	0.800	0.800
o	Nitrate+Nitrite	5.085	3.188	3.188
o	Total Kjeldahl nitrogen	2.515	3.938	3.938
o	Total suspended solids	80.003	80.229	80.229
o	VSS	12.646	43.067	43.067
o	Total phosphorus	0.326	0.321	0.321
o	Oil and grease	2.913	2.964	2.964
	Cyanide Total	0.015	0.319	0.319
	Aluminum	1.382	1.323	1.323
	Boron	0.131	0.166	0.166
	Zinc	0.051	0.097	0.097
	Mercury	0.006	*	*
	Phenolics (4AAP)	0.024	0.027	0.027
	Chloroform	0.002	0.031	0.031
	Methylene chloride	0.009	0.005	0.005
	Trichloroethylene	0.001	0.023	0.023
	Vinyl chloride	0.003	0.863	0.863
	Benzene	0.001	0.001	0.001
	Toluene	0.001	0.001	0.001
	1,2,3,5–Tetrachlorobenzene	*	*	*
	Octachlorodibenzo–p–dioxin	*	*	*

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0600 – intake water to site
PR 0100 – Final Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – CANADIANOXY CHEMICALS LTD. – FORT ERIE

	PARAMETER	UNIT	IN 0400	OT 0100
o	DOC	mg/L	1.8	2.5
o	TOC	mg/L	–	2
o	COD	mg/L	–	–
o	Ammonia plus Ammonium	mg/L	0.03	0.15
o	Nitrate+Nitrite	mg/L	–	–
o	Total Kjeldahl nitrogen	mg/L	0.1	0.6
o	Total suspended solids	mg/L	2	4
o	VSS	mg/L	–	–
o	Total phosphorus	mg/L	0.01	0.01
o	Hydrogen ion (pH)		7.9	8.1
o	Specific conductance	uS/cm	301	494
o	Oil and grease	mg/L	1.0	1.0
	Aluminum	ug/L	60.0	153.6
	Zinc	ug/L	10.0	22.7
	Phenolics (4AAP)	ug/L	1.0	46.9
	Ftflow	m3/day	–	109

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0400 – Intake Water to Site
OT 0100 – Final Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – CANADIANOXY CHEMICALS LTD. – FORT ERIE

	PARAMETER	IN 0400	OT 0100	TOTAL
o	DOC	0.214	0.288	0.288
o	TOC	–	0.312	0.312
o	COD	–	–	–
o	Ammonia plus Ammonium	0.003	0.020	0.020
o	Nitrate+Nitrite	–	–	–
o	Total Kjeldahl nitrogen	0.011	0.078	0.078
o	Total suspended solids	0.237	0.447	0.447
o	VSS	–	–	–
o	Total phosphorus	0.001	0.002	0.002
o	Oil and grease	0.119	0.109	0.109
	Aluminum	0.007	0.021	0.021
	Zinc	0.001	0.003	0.003
	Phenolics (4AAP)	*	0.007	0.007

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
OT 0100 – Final Effluent to River
IN 0400 – Intake Water to Site

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – CELANESE CANADA INC. – MILLHAVEN

	PARAMETER	UNIT	IN 0900	PR 0400	CO 0100	CO 0200	CO 0300
o	DOC	mg/L	2.7	6.8	5.5	3.3	2.6
o	TOC	mg/L	–	21	14	–	–
o	COD	mg/L	22	46	21	11	11
o	Ammonia plus Ammonium	mg/L	0.06	2.48	0.54	0.04	0.04
o	Nitrate+Nitrite	mg/L	0.31	2.16	0.94	0.29	0.28
o	Total Kjeldahl nitrogen	mg/L	0.5	3.6	0.8	0.4	0.4
o	Total suspended solids	mg/L	6	9	6	3	2
o	VSS	mg/L	4	9	2	2	1
o	Total phosphorus	mg/L	0.05	0.91	0.48	0.02	0.07
o	Hydrogen ion (pH)		8.1	8.1	8.1	8.2	8.2
o	Specific conductance	uS/cm	319	464	413	322	322
o	Oil and grease	mg/L	1.5	1.3	1.1	1.2	1.1
	Cyanide Total	mg/L	0.004	0.003	0.004	0.002	0.002
	Aluminum	ug/L	116.0	54.0	62.6	51.3	69.8
	Copper	ug/L	6.0	12.7	6.4	15.5	7.0
	Zinc	ug/L	13.2	15.1	13.4	36.0	18.8
	Antimony	ug/L	1.0	55.2	25.1	1.0	2.9
	Chromium (hexavalent)	ug/L	24.2	22.4	17.8	10.6	9.0
	Phenolics (4AAP)	ug/L	0.6	1.0	1.0	1.1	1.6
	1,1–Dichloroethane	ug/L	0.2	0.2	0.6	0.2	0.2
	1,2–Dichloroethane	ug/L	0.8	0.8	0.8	0.8	0.8
	Chloroform	ug/L	1.0	1.4	0.9	0.6	1.8
	Chloromethane	ug/L	23.8	0.7	2.4	1.8	2.8
	Methylene chloride	ug/L	4.6	1.8	4.3	3.6	4.1
	Benzene	ug/L	0.5	0.7	0.5	2.1	0.9
	Toluene	ug/L	0.5	0.2	0.2	0.3	0.4
	1,2,3,4–Tetrachlorobenzene	ng/L	55.6	1.2	2.3	1.2	1.2
	1,2,3,5–Tetrachlorobenzene	ng/L	8.4	2.1	2.1	2.1	2.1
	1,2,3–Trichlorobenzene	ng/L	59.8	3.2	3.6	3.2	3.2
	1,2,4–Trichlorobenzene	ng/L	201.4	8.4	9.9	10.4	1.8
	Pentachlorobenzene	ng/L	6.1	1.1	1.1	1.1	1.1
	Ftflow	m3/day	54470	4401	9899	32571	19845

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS:
PR 0400 – Treatment Plant Effluent flows into CO 0100
IN 0900 – Intake Water to Site
CO 0100 – Centre Outfall to Lake
CO 0200 – West Outfall to Lake
CO 0300 – East Outfall to Lake

OCM SECTOR SIX MONTH REPORT - DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – CELANESE CANADA INC. – MILLHAVEN

	PARAMETER	IN 0900	PR 0400	CO 0100	CO 0200	CO 0300	TOTAL
o	DOC	140.975	29.768	52.863	97.294	50.709	200.866
o	TOC	–	96.526	139.598	–	–	139.598
o	COD	1130.427	206.540	236.697	378.855	236.223	851.775
o	Ammonia plus Ammonium	2.527	10.882	4.713	1.078	0.672	15.595
o	Nitrate+Nitrite	18.155	9.493	10.033	10.566	5.451	26.050
o	Total Kjeldahl nitrogen	15.499	16.093	7.590	13.562	7.632	23.683
o	Total suspended solids	386.925	41.158	54.795	86.974	38.639	180.408
o	VSS	283.812	40.068	18.218	49.342	21.708	58.286
o	Total phosphorus	0.951	4.055	5.067	0.531	1.289	6.887
o	Oil and grease	42.982	5.668	11.303	36.710	21.683	69.696
	Cyanide Total	0.215	0.013	0.046	0.073	0.036	0.155
	Aluminum	4.355	0.237	0.642	1.450	1.118	3.210
	Copper	0.326	0.057	0.064	0.451	0.135	0.650
	Zinc	0.601	0.067	0.134	1.426	0.267	1.827
	Antimony	0.057	0.232	0.250	0.032	0.068	0.350
	Chromium (hexavalent)	1.499	0.092	0.158	0.277	0.171	0.606
	Phenolics (4AAP)	0.033	0.004	0.010	0.035	0.032	0.077
	1,1–Dichloroethane	0.009	0.001	0.006	0.007	0.004	0.017
	1,2–Dichloroethane	0.035	0.004	0.009	0.030	0.015	0.054
	Chloroform	0.024	0.006	0.009	0.020	0.055	0.084
	Chloromethane	2.020	0.003	0.029	0.077	0.012	0.118
	Methylene chloride	0.129	0.008	0.047	0.153	0.096	0.296
	Benzene	0.030	0.003	0.005	0.062	0.027	0.094
	Toluene	0.010	0.001	0.003	0.012	0.009	0.024
	1,2,3,4–Tetrachlorobenzene	*	*	*	*	*	*
	1,2,3,5–Tetrachlorobenzene	*	*	*	*	*	*
	1,2,3–Trichlorobenzene	*	*	*	*	*	*
	1,2,4–Trichlorobenzene	*	*	*	*	*	*
	Pentachlorobenzene	*	*	*	*	*	*

EXPLANATORY NOTES:
'–' not required by the regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0900 – Intake Water to Site
CO 0300 – East Outfall to Lake
PR 0400 – Treatment Plant Effluent flows into CO 0100
CO 0100 – Centre Outfall to Lake
CO 0200 – West Outfall to Lake

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DU PONT CANADA INC. – KINGSTON

	PARAMETER	UNIT	IN 1300	PR 0600	PR 1000	CO 0700	CO 1100
o	DOC	mg/L	1.9	4.9	142.3	4.6	6.7
o	TOC	mg/L	2	6	180	6	4
o	COD	mg/L	–	16	1280	32	36
o	Ammonia plus Ammonium	mg/L	–	0.32	0.52	0.14	1.44
o	Nitrate+Nitrite	mg/L	–	0.28	0.06	0.29	0.30
o	Total Kjeldahl nitrogen	mg/L	–	1.0	5.1	1.8	0.8
o	Total suspended solids	mg/L	10	10	71	6	9
o	VSS	mg/L	–	5	116	5	3
o	Total phosphorus	mg/L	0.1	0.1	3.0	0.1	0.4
o	Hydrogen ion (pH)		8.0	8.2	7.7	8.2	8.2
o	Specific conductance	uS/cm	322	324	332	335	363
o	Oil and grease	mg/L	1.6	1.7	214.2	2.1	1.9
	Aluminum	ug/L	71.7	45.1	41.9	37.4	45.3
	Boron	ug/L	55.0	56.7	68.3	58.3	56.7
	Copper	ug/L	33.3	21.7	15.0	10.0	11.7
	Zinc	ug/L	111.7	11.7	17.0	10.0	10.0
	Phenolics (4AAP)	ug/L	1.3	1.2	391.1	1.6	2.2
	Sulphide	ug/L	10.0	10.0	78.0	10.0	10.0
	1,1,2,2–Tetrachloroethane	ug/L	1.0	1.0	5.5	1.0	1.0
	1,1,2–Trichloroethane	ug/L	0.3	0.2	2.1	0.3	0.2
	1,1–Dichloroethane	ug/L	0.2	0.2	1.1	0.2	0.2
	1,2–Dichloroethane	ug/L	0.2	0.2	1.1	0.2	0.2
	1,2–Dichloropropane	ug/L	0.2	0.2	1.1	0.2	0.2
	Bromodichloromethane	ug/L	5.1	2.3	1.6	2.6	2.4
	Bromoform	ug/L	2.0	1.0	11.0	2.0	2.0
	Bromomethane	ug/L	2.0	1.0	11.0	2.0	2.0
	Chlorobenzene	ug/L	0.2	0.2	1.1	0.2	0.2
	Chloroform	ug/L	7.4	3.0	3.4	3.7	4.0
	Chloromethane	ug/L	2.0	2.0	11.0	2.0	2.0
	Cis–1,3–Dichloropropylene	ug/L	0.5	0.5	2.8	0.5	0.5

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DU PONT CANADA INC. – KINGSTON

	PARAMETER	UNIT	IN 1300	PR 0600	PR 1000	CO 0700	CO 1100
	Dibromochloromethane	ug/L	2.9	1.1	5.7	1.4	1.3
	Ethylene dibromide	ug/L	1.0	1.0	5.5	1.0	1.0
	Methylene chloride	ug/L	0.7	0.5	4.8	0.7	0.8
	Tetrachloroethylene	ug/L	0.5	0.5	2.8	0.5	0.5
	Trans–1,3–Dichloropropylene	ug/L	0.5	0.5	2.8	0.5	0.5
	Trichlorofluoromethane	ug/L	1.0	1.0	5.5	1.0	1.0
	Vinyl chloride	ug/L	2.0	2.0	11.0	2.0	2.0
	Benzene	ug/L	0.1	0.3	1.5	0.7	0.3
	Ethylbenzene	ug/L	0.2	0.2	1.1	0.2	0.2
	Styrene	ug/L	0.2	0.2	1.1	0.4	0.8
	Toluene	ug/L	0.2	0.2	1.2	0.2	0.3
	o–Xylene	ug/L	0.2	0.2	1.1	0.2	0.2
	Acrolein	ug/L	4.0	4.0	22.0	4.0	4.0
	Acrylonitrile	ug/L	2.0	2.0	11.0	2.0	2.0
	Biphenyl	ug/L	–	5.8	1.3	0.9	3.1
	Bis(2–ethylhexyl) phthalate	ug/L	–	2.0	16.4	2.0	2.0
	Diphenyl ether	ug/L	–	21.3	5.0	3.3	10.0
	2,3,7,8 TCDD	pg/L	–	20.0	27.5	20.0	20.0
	Octachlorodibenzo–p–dioxin	pg/L	–	30.0	55.5	30.0	30.0
	Octachlorodibenzofuran	pg/L	–	30.0	65.0	30.0	30.0
	Total H7CDD	pg/L	–	21.0	21.0	30.5	21.0
	Total TCDD	pg/L	–	20.0	210.0	20.0	20.0
	Total TCDF	pg/L	–	10.0	10.0	27.0	10.0
	Ftflow	m3/day	41980	1065	108	28221	23510

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation 'o' – conventional parameter

SAMPLING POINTS
IN 1300 – Intake Water to Site
PR 0600 – Flake Effluent flows into CO 1100
PR 1000 – Staple Sewer flows into CO 1100
CO 0700 – Service Sewer to Lake
CO 1100 – Catch Tank Effluent to Lake

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DU PONT CANADA INC. – KINGSTON

	PARAMETER	IN 1300	PR 0600	PR 1000	CO 0700	CO 1100	TOTAL
o	DOC	96.553	5.183	16.054	132.598	146.724	279.322
o	TOC	–	5.855	19.932	226.423	107.307	333.730
o	COD	–	17.545	131.760	948.859	799.202	1748.061
o	Ammonia plus Ammonium	–	0.376	0.064	3.752	35.729	39.481
o	Nitrate+Nitrite	–	0.299	0.003	8.183	6.851	15.034
o	Total Kjeldahl nitrogen	–	1.123	0.526	51.737	19.793	71.530
o	Total suspended solids	209.898	10.505	7.848	167.610	217.817	385.427
o	VSS	–	5.483	8.491	149.535	83.562	233.097
o	Total phosphorus	4.198	0.101	0.295	3.233	9.839	13.072
o	Oil and grease	41.980	1.767	24.697	58.848	43.851	102.699
	Aluminum	1.259	0.045	0.004	1.137	1.120	2.257
	Boron	2.099	0.060	0.007	1.635	1.309	2.944
	Copper	1.259	0.021	0.002	0.284	0.275	0.559
	Zinc	3.358	0.012	0.002	0.284	0.239	0.523
	Phenolics (4AAP)	0.042	0.001	0.031	0.040	0.058	0.098
	Sulphide	0.420	0 010	0.006	0.284	0.239	0.523
	1,1,2,2–Tetrachloroethane	0.042	0.001	0.001	0.028	0.024	0.052
	1,1,2–Trichloroethane	0.008	*	*	0.008	0.005	0.013
	1,1–Dichloroethane	0.008	*	*	0.006	0.005	0.011
	1,2–Dichloroethane	0.008	*	*	0.006	0.005	0.011
	1,2–Dichloropropane	0.008	*	*	0.006	0.005	0.011
	Bromodichloromethane	0.197	0.002	*	0.074	0.057	0.131
	Bromoform	0.084	0.002	0.001	0.057	0.048	0.105
	Bromomethane	0.084	0.002	0.001	0.057	0.048	0.105
	Chlorobenzene	0.008	*	*	0.006	0.005	0.011
	Chloroform	0.353	0.003	*	0.099	0.095	0.194
	Chloromethane	0.084	0.002	0.001	0.057	0.048	0.105
	Cis–1,3–Dichloropropylene	0.021	0.001	*	0.014	0.012	0.026

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DU PONT CANADA INC. – KINGSTON

	PARAMETER	IN 1300	PR 0600	PR 1000	CO 0700	CO 1100	TOTAL
	Dibromochloromethane	0.080	0.001	0.001	0.041	0.029	0.070
	Ethylene dibromide	0.042	0.001	0.001	0.028	0.024	0.052
	Methylene chloride	0.076	0.001	0.001	0.017	0.020	0.037
	Tetrachloroethylene	0.021	0.001	*	0.014	0.012	0.026
	Trans–1,3–Dichloropropylene	0.021	0.001	*	0.014	0.012	0.026
	Trichlorofluoromethane	0.042	0.001	0.001	0.028	0.024	0.052
	Vinyl chloride	0.084	0.002	0.001	0.057	0.048	0.105
	Benzene	0.004	*	*	0.015	0.006	0.021
	Ethylbenzene	0.008	*	*	0.006	0.005	0.011
	Styrene	0.008	*	*	0.012	0.016	0.028
	Toluene	0.008	*	*	0.006	0.006	0.012
	o–Xylene	0.008	*	*	0.006	0.005	0.011
	Acrolein	0.168	0.004	0.002	0.114	0.096	0.210
	Acrylonitrile	0.084	0.002	0.001	0.057	0.048	0.105
	Biphenyl	–	0.006	*	0.023	0.080	0.103
	Bis(2–ethylhexyl) phthalate	–	0.002	0.002	0.060	0.047	0.107
	Diphenyl ether	–	0.024	0.001	0.091	0.253	0.344
	2,3,7,8 TCDD	–	*	*	*	*	*
	Octachlorodibenzo–p–dioxin	–	*	*	*	*	*
	Octachlorodibenzofuran	–	*	*	*	*	*
	Total H7CDD	–	*	*	*	*	*
	Total TCDD	–	*	*	*	*	*
	Total TCDF	–	*	*	*	*	*

EXPLANATORY NOTES:
'–' not required by the regulation or no conc/flow data available
'*' loading less than 1 gram/day 'o' – conventional parameter
SAMPLING POINTS:
IN 1300 – Intake Water to Site PR 0600 – Flake Effluent flows into CO 1100
CO 0700 – Service Sewer to Lake PR 1000 – Staple Sewer flows into CO 1100
CO 1100 – Catch Tank Effluent to Lake

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – G.E. PLASTICS CANADA LTD. – COBOURG

	PARAMETER	UNIT	IN 0600	CC 0100	OT 0400
o	DOC	mg/L	–	21.2	6.6
o	TOC	mg/L	5	37	–
o	COD	mg/L	6	100	–
o	Ammonia plus Ammonium	mg/L	–	28.02	1.28
o	Nitrate+Nitrite	mg/L	–	10.22	1.58
o	Total Kjeldahl nitrogen	mg/L	–	33.4	1.8
o	Total suspended solids	mg/L	–	28	5
o	VSS	mg/L	–	27	–
o	Total phosphorus	mg/L	0.1	0.6	0.1
o	Hydrogen ion (pH)		–	7.8	7.6
o	Specific conductance	uS/cm	–	2280	459
o	Oil and grease	mg/L	1.4	3.1	2.1
	Cyanide Total	mg/L	0.002	0.116	0.002
	Aluminum	ug/L	63.2	361.2	103.0
	Zinc	ug/L	30.4	12.5	46.0
	Antimony	ug/L	2.6	52.2	11.8
	Phenolics (4AAP)	ug/L	1.8	78.0	3185.5
	Benzene	ug/L	0.8	0.3	0.2
	Ftflow	m3/day	1979	1878	119

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS:
IN 0600 – Intake Water to Site
CO 0100 – Clarifier Effluent to Lake
OT 0400 – Cooling Water to Lake

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – GE PLASTICS CANADA LTD. – COBOURG

	PARAMETER	IN 0600	CO 0100	OT 0400	TOTAL
o	DOC	–	39.264	0.426	39.690
o	TOC	–	64.801	–	64.801
o	COD	12.270	236.900	–	236.900
o	Ammonia plus Ammonium	–	52.705	0.028	52.733
o	Nitrate+Nitrite	–	16.902	0.028	16.930
o	Total Kjeldahl nitrogen	–	62.576	0.037	62.613
o	Total suspended solids	–	50.781	0.577	51.358
o	VSS	–	50.917	–	50.917
o	Total phosphorus	0.515	1.038	0.005	1.043
o	Oil and grease	3.364	5.758	0.149	5.907
	Cyanide Total	0.004	0.215	*	0.215
	Aluminum	0.119	0.576	0.009	0.585
	Zinc	0.032	0.023	0.002	0.025
	Antimony	0.002	0.090	0.001	0.091
	Phenolics (4AAP)	0.004	0.134	0.049	0.183
	Benzene	–	0.001	*	0.001

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0600 – Intake Water to Site
CO 0100 – Clarifier Effluent to Lake
OT 0400 – Cooling Water to Lake

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – STEPAN CANADA INC. – LONGFORD MILLS

	PARAMETER	UNIT	IN 0600	PR 0200	CO 0100
o	DOC	mg/L	10.5	31.2	7.8
o	TOC	mg/L	18	34	8
o	COD	mg/L	19	201	38
o	Ammonia plus Ammonium	mg/L	0.05	0.87	0.10
o	Nitrate+Nitrite	mg/L	0.10	0.36	0.15
o	Total Kjeldahl nitrogen	mg/L	0.6	3.5	0.8
o	Total suspended solids	mg/L	1	12	6
o	VSS	mg/L	–	10	2
o	Total phosphorus	mg/L	–	0.2	0.1
o	Hydrogen ion (pH)		–	6.8	7.6
o	Specific conductance	uS/cm	–	2858	415
o	Oil and grease	mg/L	1.0	12.9	4.1
	Cyanide Total	mg/L	0.005	–	–
	Aluminum	ug/L	53.0	781.2	137.5
	Boron	ug/L	29.0	57.8	29.2
	Cadmium	ug/L	2.0	6.9	2.6
	Copper	ug/L	6.5	14.6	8.8
	Lead	ug/L	37.0	15.6	10.6
	Nickel	ug/L	15.0	22.3	18.3
	Zinc	ug/L	11.0	59.6	28.2
	Phenolics (4AAP)	ug/L	6.0	18.7	3.0
	Sulphide	ug/L	20.0	14.0	17.3
	Carbon tetrachloride	ug/L	0.4	8.0	0.4
	Chloroform	ug/L	0.7	7.6	1.9
	Benzene	ug/L	0.5	0.4	0.4
	Toluene	ug/L	0.8	0.5	0.5
	Bis(2–ethylhexyl) phthalate	ug/L	2.0	3.9	2.0
	1,2,3,5–Tetrachlorobenzene	ng/L	10.0	11.5	10.0
	PCBT	ug/L	0.1	0.4	0.1
	Ftflow	m3/day	–	149	2384

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS:
IN 0600 – Intake Water to Site
PR 0200 – Clarifier Effluent flows into CO 0100
CO 0100 – Effluent to Lake

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – STEPAN CANADA INC. – LONGFORD MILLS

	PARAMETER	IN 0600	PR 0200	CO 0100	TOTAL
o	DOC	25.902	4.260	18.582	18.582
o	TOC	44.403	4.712	19.227	19.227
o	COD	45.636	23.469	89.474	89.474
o	Ammonia plus Ammonium	0.123	0.070	0.222	0.222
o	Nitrate+Nitrite	0.247	0.036	0.287	0.287
o	Total Kjeldahl nitrogen	1.480	0.400	1.649	1.649
o	Total suspended solids	2.467	1.692	13.196	13.196
o	VSS	–	1.416	4.546	4.546
o	Total phosphorus	–	0.035	0.235	0.235
o	Oil and grease	2.467	2.115	9.512	9.512
	Aluminum	0.131	0.088	0.350	0.350
	Boron	0.072	0.009	0.070	0.070
	Cadmium	0.005	0.001	0.006	0.006
	Copper	0.016	0.002	0.021	0.021
	Lead	0.091	0.002	0.024	0.024
	Nickel	0.037	0.003	0.043	0.043
	Zinc	0.027	0.008	0.068	0.068
	Phenolics (4AAP)	0.015	0.002	0.007	0.007
	Sulphide	0.049	0.002	0.041	0.041
	Carbon tetrachloride	0.001	0.001	0.001	0.001
	Chloroform	0.002	0.001	0.005	0.005
	Benzene	0.001	*	0.001	0.001
	Toluene	0.002	*	0.001	0.001
	Bis(2–ethylhexyl) phthalate	0.005	*	0.005	0.005
	1,2,3,5–Tetrachlorobenzene	*	*	*	*
	PCBT	*	*	*	*

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0600 – Intake Water to Site
CO 0100 – Effluent to Lake
PR 0200 – Clarifier Effluent flows into CO 0100

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – UNIROYAL CHEMICAL LTD. – ELMIRA

	PARAMETER	UNIT	IN 1000	IN 1100	CO 0600	CO 0800	CO 0900	OT 0200
o	DOC	mg/L	5.6	12.1	6.0	8.6	8.4	9.0
o	TOC	mg/L	–	9	–	7	7	3
o	COD	mg/L	–	–	15	6	24	–
o	Ammonia plus Ammonium	mg/L	–	1.75	0.12	0.35	0.22	0.11
o	Nitrate+Nitrite	mg/L	–	7.12	1.87	5.48	1.14	1.93
o	Total Kjeldahl nitrogen	mg/L	–	1.8	0.8	1.0	1.1	3.9
o	Total suspended solids	mg/L	4	25	4	16	11	15
o	VSS	mg/L	–	–	4	4	4	–
o	Total phosphorus	mg/L	–	1.1	0.5	0.2	0.2	0.1
o	Hydrogen ion (pH)		7.7	7.9	8.0	8.0	8.2	7.8
o	Specific conductance	uS/cm	910	1451	834	1184	1208	581
o	Oil and grease	mg/L	–	2.5	1.1	1.6	4.4	2.0
	Aluminum	ug/L	–	116.5	9.3	182.7	254.3	82.7
	Boron	ug/L	–	53.8	44.7	36.7	30.2	45.0
	Copper	ug/L	–	13.3	5.2	8.2	9.2	30.7
	Zinc	ug/L	–	14.9	32.3	110.8	49.7	12.2
	Mercury	ug/L	–	0.04	0.15	0.04	0.11	0.05
	Phenolics (4AAP)	ug/L	–	3.0	5.7	11.7	12.9	4.7
	Sulphide	ug/L	–	60.0	34.5	65.0	45.0	–
	Chloroform	ug/L	–	0.4	0.6	0.4	2.0	–
	Methylene chloride	ug/L	–	0.3	5.6	0.3	0.6	–
	Toluene	ug/L	–	0.4	5.7	18.8	419.4	0.7
	Benzylbutylphthalate	ug/L	–	–	1.4	0.6	0.6	–
	Bis(2–ethylhexyl) phthalate	ug/L	–	–	1.4	2.5	8.7	–
	Octachlorodibenzofuran	pg/L	–	22.0	22.0	23.7	160.5	–
	Total H7CDF	pg/L	–	20.0	20.0	20.0	145.0	–
	Ftflow	m3/day	4567	2449	520	2834	324	755

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 1000 – Intake Water to Site (Municipal)
IN 1100 – Shirt Factory Creek to Site
CO 0600 – Outfall #6 to River
CO 0800 – Shirt Factory Creek from Site
CO 0900 – Outfall #11 to River
OT 0200 – Outfall #2 to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – UNIROYAL CHEMICAL LTD. – ELMIRA

	PARAMETER	IN 1000	IN 1100	CO 0600	CO 0800	CO 0900	OT 0200	TOTAL
o	DOC	25.575	21.052	2.757	17.536	2.790	3.625	26.708
o	TOC	–	88.175	–	23.092	1.918	4.126	29.136
o	COD	–	–	10.225	12.276	8.517	–	31.018
o	Ammonia plus Ammonium	–	1.499	0.021	0.862	0.067	0.075	1.025
o	Nitrate+Nitrite	–	10.620	0.726	16.040	0.335	1.304	18.405
o	Total Kjeldahl nitrogen	–	2.912	0.305	2.379	0.403	0.620	3.707
o	Total suspended solids	19.181	912.385	1.801	43.314	3.421	13.838	62.374
o	VSS	–	–	3.693	6.930	1.330	–	11.953
o	Total phosphorus	–	0.794	0.352	0.327	0.071	0.118	0.868
o	Oil and grease	–	2.366	0.570	3.561	1.759	1.322	7.212
	Aluminum	–	0.211	0.004	0.245	0.114	0.089	0.452
	Boron	–	0.063	0.019	0.095	0.010	0.034	0.158
	Copper	–	0.015	0.003	0.019	0.004	0.044	0.070
	Zinc	–	0.020	0.003	0.474	0.018	0.011	0.506
	Mercury	–	*	*	*	*	*	*
	Phenolics (4AAP)	–	0.003	0.002	0.023	0.003	0.005	0.033
	Sulphide	–	0.084	0.019	0.175	0.017	–	0.211
	Chloroform	–	0.001	*	0.001	0.001	–	0.002
	Methylene chloride	–	*	0.005	0.001	*	–	0.006
	Toluene	–	*	0.001	0.048	0.076	–	0.125
	Benzylbutylphthalate	–	–	0.001	0.001	*	–	0.002
	Bis(2–ethylhexyl) phthalate	–	–	0.001	0.006	0.003	–	0.010
	Octachlorodibenzofuran	–	*	*	*	*	–	*
	Total H7CDF	–	*	*	*	*	–	*

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 1000 – Intake Water to Site (Municipal)
IN 1100 – Shirt Factory Creek to Site
CO 0600 – Outfall #6 to River
CO 0800 – Shirt Factory Creek from Site
CO 0900 – Outfall #11 to River
OT 0200 – Outfall #2 to River

APPENDIX F

SIX-MONTH AVERAGE CONCENTRATION/LOADING TABLES BY INDIVIDUAL CONTROL POINTS FOR EACH PLANT

THE ST. LAWRENCE RIVER PLANTS

	PAGE
CORNWALL CHEMICALS LTD. - CORNWALL	F-2
COURTAULDS FIBRES CANADA - CORNWALL	F-4
DUPONT CANADA INC. - MAITLAND	F-8
ROHM AND HAAS CANADA INC. - MORRISBURG	F-14

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – CORNWALL CHEMICALS LTD. – CORNWALL

	PARAMETER	UNIT	IN 0300	PR 0100
o	DOC	mg/L	3.2	5.1
o	TOC	mg/L	–	4
o	COD	mg/L	5	98
o	Ammonia plus Ammonium	mg/L	0.15	0.12
o	Nitrate+Nitrite	mg/L	0.26	0.16
o	Total Kjeldahl nitrogen	mg/L	0.4	0.8
o	Total suspended solids	mg/L	6	8
o	VSS	mg/L	–	14
o	Total phosphorus	mg/L	0.02	0.13
o	Hydrogen ion (pH)		7.8	6.3
o	Specific conductance	uS/cm	226	1682
o	Oil and grease	mg/L	0.9	5.6
	Aluminum	ug/L	62.3	276.7
	Beryllium	ug/L	12.3	5.0
	Boron	ug/L	–	132.8
	Cadmium	ug/L	9.0	0.4
	Copper	ug/L	13.2	12.0
	Molybdenum	ug/L	31.7	31.8
	Thallium	ug/L	33.0	11.2
	Vanadium	ug/L	67.0	9.3
	Zinc	ug/L	11.2	45.1
	Mercury	ug/L	0.58	3.81
	Sulphide	ug/L	16.7	7265.4
	Bromodichloromethane	ug/L	2.9	2.3
	Carbon tetrachloride	ug/L	0.6	19235.0
	Chloroform	ug/L	8.2	64.3
	Chloromethane	ug/L	1.5	52.0
	Methylene chloride	ug/L	0.6	5.1
	Tetrachloroethylene	ug/L	0.4	1.4
	Trichloroethylene	ug/L	0.4	1.9
	Hexachlorobenzene	ng/L	4.3	73.9
	Hexachlorobutadiene	ng/L	5.8	55.6
	Hexachlorocyclopentadiene	ng/L	17.0	12.6
	Hexachloroethane	ng/L	4.5	538.7
	Ftflow	m3/day	–	653

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 0300 – Intake Water to Site
PR 0100 – Manhole 26 Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – CORNWALL CHEMICALS LTD. – CORNWALL

	PARAMETER	IN 0300	PR 0100	TOTAL
o	DOC	2.110	3.377	3.377
o	TOC	–	2.758	2.758
o	COD	3.264	49.253	49.253
o	Ammonia plus Ammonium	0.098	0.059	0.059
o	Nitrate+Nitrite	0.170	0.080	0.080
o	Total Kjeldahl nitrogen	0.255	0.382	0.382
o	Total suspended solids	3.916	5.674	5.674
o	VSS	–	7.355	7.355
o	Total phosphorus	0.015	0.088	0.088
o	Oil and grease	0.587	3.879	3.879
	Aluminum	0.041	0.165	0.165
	Beryllium	0.008	0.003	0.003
	Boron	–	0.093	0.093
	Cadmium	0.006	*	*
	Copper	0.009	0.008	0.008
	Molybdenum	0.021	0.020	0.020
	Thallium	0.022	0.007	0.007
	Vanadium	0.044	0.006	0.006
	Zinc	0.007	0.030	0.030
	Mercury	*	0.003	0.003
	Sulphide	0.011	4.997	4.997
	Bromodichloromethane	0.002	0.001	0.001
	Carbon tetrachloride	*	12.770	12.770
	Chloroform	0.005	0.039	0.039
	Chloromethane	0.001	0.027	0.027
	Methylene chloride	*	0.003	0.003
	Tetrachloroethylene	*	0.001	0.001
	Trichloroethylene	*	0.001	0.001
	Hexachlorobenzene	*	*	*
	Hexachlorobutadiene	*	*	*
	Hexachlorocyclopentadiene	*	*	*
	Hexachloroethane	*	*	*

EXPLANATORY NOTES:
'–' not required by the regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0300 – Intake Water to Site
PR 0100 – Manhole 26 Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – COURTAULDS FIBRES CANADA – CORNWALL

	PARAMETER	UNIT	IN 1300	PR 0100	PR 0300	CO 0500	CO 0600	CO 0700	CO 0800
o	DOC	mg/L	5.3	227.7	105.2	7.5	5.9	6.1	6.7
o	TOC	mg/L	–	239	142	4	4	4	3
o	COD	mg/L	18	425	515	23	17	25	24
o	Ammonia plus Ammonium	mg/L	0.22	0.33	0.23	0.03	0.25	0.18	0.14
o	Nitrate+Nitrite	mg/L	0.22	0.46	0.35	0.09	0.17	0.17	0.22
o	Total Kjeldahl nitrogen	mg/L	1.3	0.3	1.9	0.2	0.1	0.1	0.2
o	Total suspended solids	mg/L	1	92	104	7	6	6	6
o	VSS	mg/L	1	75	51	5	5	6	5
o	Total phosphorus	mg/L	0.2	0.2	0.1	0.1	0.1	0.2	0.1
o	Hydrogen ion (pH)		–	2.1	11.2	7.8	10.3	6.6	6.7
o	Specific conductance	uS/cm	–	8676	3767	346	385	383	455
o	Oil and grease	mg/L	100.7	115.1	78.7	1.6	2.3	2.3	5.9
	Cyanide Total	mg/L	0.001	0.007	0.012	0.001	0.001	0.001	0.001
	Aluminum	ug/L	109.0	504.0	129.5	42.3	34.5	50.8	47.0
	Boron	ug/L	94.7	44.7	41.2	32.7	21.5	21.3	22.3
	Cadmium	ug/L	2.3	1.0	1.0	1.0	1.0	1.0	1.0
	Chromium	ug/L	5.3	137.8	47.8	20.8	7.3	6.7	7.0
	Copper	ug/L	4.7	71.7	22.7	5.7	3.0	3.5	4.3
	Lead	ug/L	8.0	247.7	114.0	9.3	9.3	9.8	10.2
	Nickel	ug/L	6.7	37.7	16.4	8.5	8.7	8.7	8.7
	Zinc	ug/L	141.7	53585.4	2133.5	315.2	1275.3	1661.3	1810.3
	Antimony	ug/L	3.0	9.0	2.3	3.0	1.8	3.0	3.0
	Chromium (hexavalent)	ug/L	20.0	35.0	–	20.0	–	20.0	20.0
	Mercury	ug/L	0.03	15.25	5.19	0.30	0.27	0.30	0.21
	Phenolics (4AAP)	ug/L	1.4	23.4	29.6	3.4	5.0	4.5	5.0
	Sulphide	ug/L	317.3	36718.7	89283.4	3674.5	991.3	1418.1	1271.8

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – COURTAULDS FIBRES CANADA – CORNWALL

	PARAMETER	UNIT	IN 1300	PR 0100	PR 0300	CO 0500	CO 0600	CO 0700	CO 0800
	Chloroform	ug/L	0.4	42.6	23.8	0.4	0.4	0.4	0.4
	Biphenyl	ug/L	0.7	0.4	0.4	0.4	0.4	0.4	0.4
	Bis(2–ethylhexyl) phthalate	ug/L	1.4	4.7	4.6	1.4	1.4	1.4	1.4
	Di–n–octyl phthalate	ug/L	0.8	0.8	3.7	0.9	1.0	0.8	0.8
	Diphenyl ether	ug/L	0.7	0.4	0.4	0.4	0.4	0.4	0.4
	1,2,3–Trichlorobenzene	ng/L	6.1	8.6	8.6	8.6	8.6	8.6	11.3
	2,4,5–Trichlorotoluene	ng/L	2.1	2.7	2.7	3.4	2.7	2.7	8.9
	Hexachlorobenzene	ng/L	2.3	3.5	3.0	3.0	3.0	3.0	10.2
	Hexachloroethane	ng/L	14.2	1.7	1.7	1.7	1.7	1.7	2.2
	Pentachlorobenzene	ng/L	3.0	2.1	2.1	2.1	2.1	2.1	9.2
	Ftflow	m3/day	–	6005	2050	11170	33729	6529	11058

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS:
IN 1300 – Intake to Site
PR 0100 – Acid Sewer to River
PR 0300 – Alkaline Sewer to River
CO 0500 – Storm Sewer to River
CO 0600 – Acid Recovery Sewer to River
CO 0700 – CS2 Sewer to River
CO 0800 – Caravelle Sewer to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – COURTAULDS FIBRES CANADA – CORNWALL

	PARAMETER	IN 1300	PR 0100	PR 0300	CO 0500	CO 0600	CO 0700	CO 0800	TOTAL
o	DOC	371.141	1219.995	205.411	69.530	190.785	40.838	72.883	1799.442
o	TOC	–	1269.275	376.466	39.827	101.110	31.824	40.983	1859.485
o	COD	1260.478	2910.075	1375.155	329.083	692.698	155.777	270.705	5733.493
o	Ammonia plus Ammonium	15.616	2.590	0.314	0.358	7.980	1.494	1.244	13.980
o	Nitrate+Nitrite	15.196	2.365	0.860	1.236	7.066	1.100	2.495	15.122
o	Total Kjeldahl nitrogen	89.144	1.714	1.247	2.291	4.453	0.670	1.696	12.071
o	Total suspended solids	70.027	570.946	262.676	82.324	187.569	43.752	63.703	1210.970
o	VSS	70.027	460.131	86.173	56.543	159.693	39.916	56.655	859.111
o	Total phosphorus	15.616	1.168	0.154	1.341	4.164	1.114	1.564	9.505
o	Oil and grease	7053.772	634.768	140.824	17.941	73.640	16.088	58.913	942.174
	Cyanide Total	0.07	0.051	0.035	0.007	0.023	0.003	0.006	0.125
	Aluminum	7.633	2.565	0.427	0.493	1.220	0.332	0.489	5.526
	Boron	6.629	0.266	0.080	0.351	0.744	0.125	0.247	1.813
	Cadmium	0.163	0.006	0.002	0.013	0.034	0.006	0.011	0.072
	Chromium	0.373	0.818	0.047	0.192	0.226	0.038	0.075	1.396
	Copper	0.327	0.404	0.083	0.067	0.102	0.023	0.047	0.726
	Lead	0.560	1.440	0.210	0.117	0.318	0.059	0.111	2.255
	Nickel	0.467	0.205	0.027	0.106	0.295	0.051	0.095	0.779
	Zinc	9.920	308.886	12.657	3.260	42.926	11.348	20.873	399.950
	Antimony	0.210	0.054	0.008	0.043	0.077	0.021	0.032	0.235
	Chromium (hexavalent)	1.401	0.167	–	0.214	–	0.119	0.226	0.726
	Mercury	0.002	0.089	0.015	0.003	0.009	0.002	0.002	0.120
	Phenolics (4AAP)	0.098	0.131	0.077	0.044	0.200	0.033	0.053	0.538
	Sulphide	22.222	213.139	210.843	41.028	33.601	9.044	14.679	522.334

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – COURTAULDS FIBRES CANADA – CORNWALL

	PARAMETER	IN 1300	PR 0100	PR 0300	CO 0500	CO 0600	CO 0700	CO 0800	TOTAL
	Chloroform	0.028	0.235	0.090	0.005	0.014	0.003	0.004	0.351
	Biphenyl	0.046	0.003	0.001	0.006	0.015	0.003	0.004	0.032
	Bis(2–ethylhexyl) phthalate	0.098	0.028	0.017	0.020	0.054	0.010	0.015	0.144
	Di–n–octyl phthalate	0.056	0.005	0.259	0.013	0.040	0.006	0.008	0.331
	Diphenyl ether	0.046	0.003	0.001	0.006	0.015	0.003	0.004	0.032
	1,2,3–Trichlorobenzene	*	*	*	*	*	*	*	*
	2,4,5–Trichlorotoluene	*	*	*	*	*	*	*	*
	Hexachlorobenzene	*	*	*	*	*	*	*	*
	Hexachloroethane	0.001	*	*	*	*	*	*	*
	Pentachlorobenzene	*	*	*	*	*	*	*	*

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 1300 – Intake Water to Site
PR 0100 – Acid Sewer to River
PR 0300 – Alkaline Sewer to River
CO 0500 – Storm Sewer to River
CO 0600 – Acid Recovery Sewer to River
CO 0700 – CS2 Sewer to River
CO 0800 – Caravelle Sewer to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DU PONT CANADA INC. – MAITLAND

	PARAMETER	UNIT	IN 1000	PR 0300	CO 0400	CO 0500	CO 0700	CO 1100
o	DOC	mg/L	2.3	79.1	2.6	3.6	14.8	7.2
o	TOC	mg/L	–	100	4	4	8	12
o	COD	mg/L	13	303	13	14	374	101
o	Ammonia plus Ammonium	mg/L	0.10	21.36	0.18	0.21	0.21	1.10
o	Nitrate+Nitrite	mg/L	0.33	13.44	0.51	2.85	1.37	2.79
o	Total Kjeldahl nitrogen	mg/L	0.9	43.1	0.4	0.7	1.4	4.1
o	Total suspended solids	mg/L	18	326	19	7	6	14
o	VSS	mg/L	5	369	4	5	5	14
o	Total phosphorus	mg/L	0.1	3.8	0.1	0.1	0.1	0.2
o	Hydrogen ion (pH)		8.1	8.2	8.7	7.3	7.8	7.7
o	Specific conductance	uS/cm	313	1951	1341	582	381	412
o	Oil and grease	mg/L	1.0	4.8	1.2	1.0	1.0	2.5
	Cyanide Total	mg/L	0.005	0.214	0.005	0.013	0.015	0.065
	Aluminum	ug/L	51.7	61.7	130.0	31.7	55.0	55.0
	Boron	ug/L	61.7	68.3	145.0	65.0	50.0	60.0
	Cobalt	ug/L	20.0	64.6	20.0	20.0	20.0	20.0
	Copper	ug/L	10.0	187.5	10.0	16.7	10.0	84.0
	Nickel	ug/L	10.0	13.3	15.0	10.0	10.0	10.0
	Vanadium	ug/L	20.0	69.0	20.0	20.0	25.0	20.0
	Zinc	ug/L	10.0	75.0	10.0	10.0	10.0	100.0
	Antimony	ug/L	1.9	2.0	154.2	17.5	4.5	6.5
	Arsenic	ug/L	2.0	2.0	20.9	2.0	2.0	2.2
	Phenolics (4AAP)	ug/L	1.7	29.8	5.3	5.3	7.8	10.8
	Sulphide	ug/L	10.0	16.5	23.0	10.0	10.0	10.0

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DU PONT CANADA INC. – MAITLAND

	PARAMETER	UNIT	IN 1000	PR 0300	CO 0400	CO 0500	CO 0700	CO 1100
	1,1,2,2–Tetrachloroethane	ug/L	1.0	19.5	176.6	52.5	52.5	1.7
	1,1,2–Trichloroethane	ug/L	0.3	4.0	25.7	10.5	10.5	0.4
	1,1–Dichloroethane	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	1,1–Dichloroethylene	ug/L	0.5	9.8	36.7	26.3	26.3	0.8
	1,2–Dichlorobenzene	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	1,2–Dichloroethane	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	1,2–Dichloropropane	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	1,3–Dichlorobenzene	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	1,4–Dichlorobenzene	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	Bromodichloromethane	ug/L	0.4	3.9	26.9	10.7	10.5	0.8
	Bromoform	ug/L	2.0	39.0	146.7	105.0	105.0	3.3
	Bromomethane	ug/L	2.0	39.0	146.7	105.0	105.0	3.3
	Carbon tetrachloride	ug/L	0.2	3.9	173.0	10.8	13.6	1.2
	Chlorobenzene	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	Chloroform	ug/L	1.4	2.0	71.7	11.3	11.7	1.8
	Chloromethane	ug/L	2.0	39.0	146.7	105.0	105.0	3.3
	Cis–1,3–Dichloropropylene	ug/L	0.5	9.8	36.7	26.3	26.3	0.8
	Dibromochloromethane	ug/L	1.0	19.5	176.6	52.5	52.5	1.7
	Ethylene dibromide	ug/L	1.0	19.5	73.3	52.5	52.5	1.7
	Methylene chloride	ug/L	1.3	1.9	44.0	2.5	2.5	1.1
	Tetrachloroethylene	ug/L	0.5	9.8	5294.7	26.7	248.4	16.2
	Trans–1,2–Dichloroethylene	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	Trans–1,3–Dichloropropylene	ug/L	0.5	9.8	36.7	26.3	26.3	0.8
	Trichloroethylene	ug/L	0.2	3.9	14.7	10.5	10.5	0.3
	Trichlorofluoromethane	ug/L	1.0	19.5	3615.5	54.2	100.3	17.3
	Vinyl chloride	ug/L	2.0	39.0	146.7	105.0	105.0	3.3
	Benzene	ug/L	0.1	2.4	7.9	6.0	101.1	0.8
	Ethylbenzene	ug/L	0.2	3.9	12.0	10.5	10.5	0.3
	Styrene	ug/L	0.2	3.9	12.0	10.5	10.5	0.3

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE CONCENTRATION VALUES
PLANT SITE – DU PONT CANADA INC. – MAITLAND

	PARAMETER	UNIT	IN 1000	PR 0300	CO 0400	CO 0500	CO 0700	CO 1100
	Toluene	ug/L	0.2	3.9	12.0	10.5	10.5	0.5
	m–Xylene and p–Xylene	ug/L	0.2	4.2	12.0	10.5	10.5	0.5
	o–Xylene	ug/L	0.2	3.9	12.0	10.5	10.5	0.3
	Acrolein	ug/L	4.0	202.0	240.0	210.0	210.0	12.0
	Acrylonitrile	ug/L	2.0	101.0	120.0	105.0	105.0	6.0
	Biphenyl	ug/L	0.5	18.6	0.5	1.5	2.6	0.5
	Bis(2–ethylhexyl) phthalate	ug/L	2.0	2.0	3.6	2.0	2.0	2.0
	Diphenyl ether	ug/L	0.4	179.2	0.5	3.8	10.1	0.5
	1,2,4–Trichlorobenzene	ng/L	6.0	8.7	67.5	5.5	7.5	7.7
	2,4,5–Trichlorotoluene	ng/L	5.0	8.7	8.5	5.0	5.5	6.5
	Hexachlorobenzene	ng/L	6.0	8.3	178.0	5.0	6.5	5.5
	Hexachlorobutadiene	ng/L	5.5	8.7	33.5	5.0	7.5	6.2
	Hexachloroethane	ng/L	5.5	8.3	162.0	5.0	15.0	10.5
	2,3,7,8 TCDD	pg/L	20.0	20.0	27.5	20.0	20.0	22.5
	Octachlorodibenzo–p–dioxin	pg/L	30.0	50.0	34.5	35.5	220.0	30.0
	Octachlorodibenzofuran	pg/L	30.0	30.0	165.5	30.0	48.0	30.0
	Total PCDD	pg/L	10.0	20.0	28.0	20.0	20.0	20.0
	Total TCDD	pg/L	20.0	20.0	55.0	20.0	20.0	1310.0
	Ftflow	m3/day	–	6479	5821	14202	54736	171943

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS
IN 1000 – Intake Water to Site
PR 0300 – WTP Effluent flows into CO 1100
CO 0400 – CFH Effluent flows into CO 0700
CO 0500 – Spandex, Polymers, Powerhouse Effluent flows into CO 1100
CO 0700 – Cribbed Ditch flows into CO 1100
CO 1100 – Site Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DU PONT CANADA INC. – MAITLAND

	PARAMETER	IN 1000	PR 0300	CO 0400	CO 0500	CO 0700	CO 1100	TOTAL
o	DOC	387.388	868.573	15.227	50.512	808.991	1248.333	1248.333
o	TOC	–	993.818	20.796	48.640	456.000	2035.068	2035.068
o	COD	2149.293	383.500	75.700	184.500	23514.00	18506.00	18506.00
o	Ammonia plus Ammonium	17.882	98.855	1.062	2.565	11.522	165.876	165.876
o	Nitrate+Nitrite	57.429	155.178	3.093	36.919	74.998	393.102	393.102
o	Total Kjeldahl nitrogen	57.945	226.762	2.365	9.635	77.738	653.142	653.142
o	Total suspended solids	3011.417	1989.798	110.719	85.906	311.919	2418.363	2418.363
o	VSS	859.717	2895.070	23.693	66.500	285.000	2576.000	2576.000
o	Total phosphorus	17.194	18.856	0.598	1.396	5.683	36.740	36.740
o	Oil and grease	179.337	11.200	7.108	14.962	54.682	529.152	529.152
	Cyanide Total	0.860	1.435	0.030	0.168	0.794	11.963	11.963
	Aluminum	8.884	0.700	0.784	0.437	3.285	8.993	8.993
	Boron	10.603	0.740	0.873	0.918	2.850	9.284	9.284
	Cobalt	3.439	0.531	0.121	0.279	1.140	3.342	3.342
	Copper	1.719	1.659	0.061	0.236	0.570	13.915	13.915
	Nickel	1.719	0.148	0.091	0.139	0.570	1.500	1.500
	Vanadium	3.439	0.739	0.121	0.279	1.455	3.000	3.000
	Zinc	1.719	0.217	0.061	0.139	0.570	10.409	10.409
	Antimony	0.333	0.014	0.892	0.206	0.272	1.071	1.071
	Arsenic	0.344	0.015	0.116	0.027	0.114	0.330	0.330
	Phenolics (4AAP)	0.288	0.028	0.032	0.070	0.455	1.972	1.972
	Sulphide	1.719	0.059	0.138	0.133	0.570	1.840	1.840

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DU PONT CANADA INC. – MAITLAND

PARAMETER	IN 1000	PR 0300	CO 0400	CO 0500	CO 0700	CO 1100	TOTAL
1,1,2,2–Tetrachloroethane	0.172	0.315	1.041	0.617	3.278	0.274	0.274
1,1,2–Trichloroethane	0.043	0.063	0.146	0.123	0.656	0.560	0.560
1,1–Dichloroethane	0.034	0.063	0.086	0.123	0.656	0.055	0.055
1,1–Dichloroethylene	0.086	0.157	0.214	0.309	0.656	0.137	0.137
1,2–Dichlorobenzene	0.034	0.063	0.086	0.123	0.656	0.055	0.055
1,2–Dichloroethane	0.034	0.063	0.086	0.123	0.656	0.055	0.055
1,2–Dichloropropane	0.034	0.063	0.086	0.123	0.656	0.055	0.055
1,3–Dichlorobenzene	0.034	0.063	0.086	0.123	0.656	0.055	0.055
1,4–Dichlorobenzene	0.034	0.063	0.086	0.123	0.656	0.055	0.055
Bromodichloromethane	0.069	0.063	0.161	0.126	0.656	0.110	0.110
Bromoform	0.344	0.630	0.855	1.235	6.555	0.548	0.548
Bromomethane	0.344	0.630	0.855	1.235	6.555	0.548	0.548
Carbon tetrachloride	0.034	0.063	0.997	0.128	0.814	0.189	0.189
Chlorobenzene	0.034	0.063	0.086	0.123	0.656	0.055	0.055
Chloroform	0.238	0.020	0.448	0.135	0.717	0.243	0.243
Chloromethane	0.344	0.630	0.855	1.235	6.555	0.548	0.548
Cis–1,3–Dichloropropylene	0.086	0.157	0.214	0.309	1.639	0.137	0.137
Dibromochloromethane	0.172	0.315	1.040	0.617	3.278	0.274	0.274
Ethylene dibromide	0.172	0.315	0.428	0.617	3.278	0.274	0.274
Methylene chloride	0.222	0.321	7.524	0.428	0.428	0.195	0.195
Tetrachloroethylene	0.086	0.157	30.263	0.315	15.578	2.849	2.849
Trans–1,2–Dichloroethylene	0.034	0.063	0.086	0.123	0.656	0.055	0.055
Trans–1,3–Dichloropropylene	0.086	0.157	0.214	0.309	1.639	0.137	0.137
Trichloroethylene	0.034	0.063	0.086	0.123	0.656	0.055	0.055
Trichlorofluoromethane	0.172	0.315	20.851	0.642	6.093	2.653	2.653
Vinyl chloride	0.344	0.630	0.855	1.235	6.555	0.548	0.548
Benzene	0.017	0.038	0.047	0.072	6.356	0.130	0.130
Ethylbenzene	0.034	0.063	0.072	0.123	0.656	0.055	0.055
Styrene	0.034	0.063	0.072	0.123	0.656	0.055	0.055

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT
SIX MONTH AVERAGE LOADING VALUES (kg/day)
PLANT SITE – DU PONT CANADA INC. – MAITLAND

	PARAMETER	IN 1000	PR 0300	CO 0400	CO 0500	CO 0700	CO 1100	TOTAL
	Toluene	0.034	0.063	0.072	0.123	0.656	0.075	0.075
	m–Xylene and p–Xylene	0.037	0.068	0.072	0.123	0.656	0.082	0.082
	o–Xylene	0.034	0.063	0.072	0.123	0.656	0.055	0.055
	Acrolein	0.688	2.360	1.444	2.470	13.110	2.224	2.224
	Acrylonitrile	0.344	1.180	0.722	1.235	6.555	1.112	1.112
	Biphenyl	0.086	0.003	0.003	0.021	0.133	0.092	0.092
	Bis(2–ethylhexyl) phthalate	0.344	0.012	0.022	0.027	0.114	0.368	0.368
	Diphenyl ether	0.069	0.002	0.003	0.056	0.518	0.092	0.092
	1,2,4–Trichlorobenzene	0.001	*	*	*	*	0.001	0.001
	2,4,5–Trichlorotoluene	0.001	*	*	*	*	0.001	0.001
	Hexachlorobenzene	0.001	*	0.001	*	*	0.001	0.001
	Hexachlorobutadiene	0.001	*	*	*	*	0.001	0.001
	Hexachloroethane	0.001	*	0.001	*	0.001	0.002	0.002
	2,3,7,8 TCDD	*	*	*	*	*	*	*
	Octachlorodibenzo–p–dioxin	*	*	*	*	*	*	*
	Octachlorodibenzofuran	*	*	*	*	*	*	*
	Total PCDD	*	*	*	*	*	*	*
	Total TCDD	*	*	*	*	*	*	*

EXPLANATORY NOTES:
'–' not required by the regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 1000 – Intake Water to Site
PR 0300 – WTP Effluent flows into CO 1100
CO 0400 – CFH Effluent flows into CO 0700
CO 0500 – Spandex,Polymers,Powerhouse Effluent flows into CO 1100
CO 0700 – Cribbed Ditch flows into CO 1100
CO 1100 – Site Effluent to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MARCH 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE CONCENTRATION VALUES

PLANT SITE – ROHM AND HAAS CANADA INC. – MORRISBURG

	PARAMETER	UNIT	IN 0500	PR 0200	CO 0100
o	DOC	mg/L	–	7.8	15.7
o	TOC	mg/L	–	–	22
o	COD	mg/L	–	32	139
o	Ammonia plus Ammonium	mg/L	–	0.03	0.20
o	Nitrate+Nitrite	mg/L	–	0.21	0.27
o	Total Kjeldahl nitrogen	mg/L	–	0.6	0.9
o	Total suspended solids	mg/L	–	4	7
o	VSS	mg/L	–	4	5
o	Total phosphorus	mg/L	–	0.1	0.3
o	Hydrogen ion (pH)		–	7.9	7.8
o	Specific conductance	uS/cm	–	342	448
o	Oil and grease	mg/L	–	2.4	2.1
	Cyanide Total	mg/L	–	0.005	0.004
	Aluminum	ug/L	–	21.5	33.5
	Copper	ug/L	–	7.3	16.5
	Zinc	ug/L	–	5.8	14.3
	Antimony	ug/L	–	3.0	18.0
	Phenolics (4AAP)	ug/L	–	3.3	4.7
	Sulphide	ug/L	–	31.2	51.5
	Bromodichloromethane	ug/L	10.9	4.2	3.0
	Chloroform	ug/L	16.8	8.7	27.0
	Dibromochloromethane	ug/L	3.7	3.1	0.8
	Ethylbenzene	ug/L	0.4	3.7	1.3
	Toluene	ug/L	0.4	55.0	153.6
	m–Xylene and p–Xylene	ug/L	0.5	14.2	5.4
	o–Xylene	ug/L	0.4	9.9	4.8
	Naphthalene	ug/L	–	0.3	1.1
	2,4–Dichlorophenol	ug/L	–	1.6	1.5
	Ftflow	m3/day	640	357	620

EXPLANATORY NOTES:
'–' no concentration data available or not required by regulation
'o' – conventional parameter

SAMPLING POINTS:
IN 0500 – Intake Water to Site
PR 0200 – Oil Additives Process Effluent flows into CO 0100
CO 0100 – Final Outfall to River

OCM SECTOR SIX MONTH REPORT – DATA FROM OCT 01/89 TO MAR 31/90

PARAMETERS FOUND AT EACH SAMPLING POINT

SIX MONTH AVERAGE LOADING VALUES (kg/day)

PLANT SITE – ROHM AND HAAS CANADA INC. – MORRISBURG

	PARAMETER	IN 0500	PR 0200	CO 0100	TOTAL
o	DOC	–	2.709	9.583	9.583
o	TOC	–	–	12.387	12.387
o	COD	–	13.225	88.642	88.642
o	Ammonia plus Ammonium	–	0.011	0.130	0.130
o	Nitrate+Nitrite	–	0.080	0.168	0.168
o	Total Kjeldahl nitrogen	–	0.244	0.554	0.554
o	Total suspended solids	–	1.230	4.221	4.221
o	VSS	–	1.370	2.867	2.867
o	Total phosphorus	–	0.057	0.184	0.184
o	Oil and grease	–	0.886	1.410	1.410
	Cyanide Total	–	0.002	0.002	0.002
	Aluminum	–	0.009	0.023	0.023
	Copper	–	0.003	0.012	0.012
	Zinc	–	0.002	0.010	0.010
	Antimony	–	0.001	0.011	0.011
	Phenolics (4AAP)	–	0.001	0.003	0.003
	Sulphide	–	0.013	0.035	0.035
	Bromodichloromethane	0.007	0.002	0.002	0.002
	Chloroform	0.010	0.003	0.018	0.018
	Dibromochloromethane	0.002	0.001	0.001	0.001
	Ethylbenzene	*	0.001	0.001	0.001
	Toluene	*	0.023	0.114	0.114
	m–Xylene and p–Xylene	*	0.005	0.003	0.003
	o–Xylene	*	0.004	0.003	0.003
	Naphthalene	–	*	0.001	0.001
	2,4–Dichlorophenol	–	0.001	0.001	0.001

EXPLANATORY NOTES:
'–' not required by regulation or no conc/flow data available
'*' loading less than 1 gram/day
'o' – conventional parameter

SAMPLING POINTS:
IN 0500 – Intake Water to Site
PR 0200 – Oil Additives Process Effluent flows into CO 0100
CO 0100 – Final Outfall to River